RAILROAD GAZETTE

FRIDAY, SEPTEMBER 1.

Contributions.

Extinguishing Fires in Trains.

SACRAMENTO, Aug. 19, 1882.

TO THE EDITOR OF THE RAILROAD GAZETTE :

In the *Gazette* of Aug. 11, 1882, I see an article in regard to means for extinguishing fires on railway trains, invented by Mr. Robert Blackall, Superintendent of machinery, of the Delaware & Hudson Canal Company. The arrangement you speak of has been in use for a number of years upon locomotives owned by this company, not only in connection with the injector, but with independent steam feed-pumps; fires have been extinguished in our snow sheds with the apparatus.

A. J. STEVENS, General Master Mechanic.

Freight Accounts.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The object of this letter is to give the method of dealing with freight accounts used by the accounting department of the Pennsylvania Company operating the lines west of Pittsburgh, controlled by the Pennsylvania Railroad Company. This method has been adopted by other companies, but may be new to many readers of the *Railroad Gazette*.

The basis of the method is the freight manifest. This is made in copying ink (the printed headings are in the same ink), and, by copy, forms the record in the local office and the basis of the record in the Auditor's office at Pittsburgh. Each station numbers its manifests in order; its number, therefore, gives information whether the manifest has been received in order of issue and how many issues are missing. The copy of manifest received by the Auditor's office is recorded in a book of ruled columns and printed headings, which require its date, its number as that station's way-bill, the number of the car carrying the freight, and any charges paid to other roads on this freight, the amount of freight bill prepaid, and any over or under freight or other charges.

This portion of the record forms the first entry of the Auditor's account. On the same page of the same book are kept the necessary statistical records. The Ohio and other state laws require a record of the freight classified in an order represented on the book by ruled columns with printed headings as follows:

Product of the forest (lumber and other articles); products of the mine (coal, coke, ore, stone, lime and other articles); agricultural products (flour, grain, and other articles); manufactures (petroleum, pig and bloom iron, iron and steel rails and other finished iron and other articles). Also the total weight of freights classified as local and foreign freights, and the revenue received for carrying these classified in the same way; also weight of company's supplies.

All these statistical facts are kept in the easiest way, it being simply necessary to write the weight of each class under the appropriate headings, forming part of the same page, which already bears the records for the accounts.

This page, I should now explain, is devoted to the freight transactions of one month for one direction between two stations, as Fort Wayne and Pittsburgh. Its footings show at close of month the exact total of freight sent from Fort Wayne to Pittsburgh, the charges on the same, and the amount prepaid at Fort Wayne, besides the statistical information noted above.

These totals of account are now entered upon another book known as the station monthly freight account. This book, or rather each page of the book, has the names of the stations in order from Pittsburgh westward. It has also the proper columns for the following printed headings: (1) Freight, Dr.; (2) Charges, Dr.; (3) Total of Way-bills, Dr.; (4) Collections on freight forwarded, Dr.; (5) Charges paid on freight forwarded, Cr.; (6) Freight collected at other stations, Cr.; (7) Totals (Dr. and Cr.); (8) Balances (Dr. and Cr.). This page filled out as the account for Pittsburgh station for the month of August will show the amount of freight received by Pittsburgh, the charges due to any station paid on freight forwarded to Pittsburgh, the amount due for collections made on freight forwarded by Pittsburgh to other stations, and also the amount by which Pittsburgh has paid charges on freight forwarded to any station, and the amount by which Pittsburgh is to be credited by collections made by other stations on freight forwarded to it.

As will be evident, a page of this book is a condensed statement of the transactions of Pittsburgh with other freight stations, so far as collections and disbursements are concerned. It is, however, more than a mere condensed transcript of the other book, for it is also a ledger account. If Pittsburgh has paid charges, it is shown as creditor for these amounts; if it has made collections on prepaid freight bills, it is debited to these amounts, and each station to which it has forwarded the freight is on its proper page of the same book properly credited. Finally Pittsburgh is shown as owing each station which has sent it freight amounts to the totals of the way-bills of that freight. The balance of the page will show how much Pittsburgh is accountable for to the Treasurer for the transactions of the month of August.

Details.—In order to give a connected account of the method of using the copy of the manifest received from the freight station, I have passed by several important details.

Before the manifest is recorded, it is examined by a clerk of the Auditor's office as to correctness of rates and figures. If correct, it is stamped with the clerk's letter (A, or B, or C), and the date of the examination, in order to include him in the responsibility for its form. If it is not correct, both the receiving and the shipping agent are immediately notified.

After being recorded as described, all the manifests of a station are bound at the close of a month in a volume in order as numbered.

Each station agent makes out four reports at the close of each month, whose blanks are designated A, B, C, D* and E.

Blank "A," or monthly account current, has this notice and requirement: "This statement shows all the company's business at the station in charge of the agent, and must be made out and forwarded to the auditor on or before the 8th of the month, and must be certified by signature of the agent personally, and not by his clerk or any other person." The reverse of the blank is a form requiring a full list and description of all uncollected bills, and reasons why uncollected. Blank "B" is a report of freight way-bills received. "It must contain particulars of each way-bill of the preceding month, from the several stations, commencing with Pittsburgh, or the station furthest east from whence freight has been received, and following the regular order of stations westward. The bills from each station must be footed up, and the footing recapitulated. Foot all the columns in the recapitulation and the footing of charges to that of freight."

Blank "C" is a report of collections made and charges paid freight forwarded, requiring date, number of manifest, the station and amount of charges. Blank "D" is a report of the daily disbursements. It requires the amount remitted (daily) to the Treasurer, on both freight and passenger accounts, and charges paid on freight forwarded. Blank "E" is an abstract of freight charges paid during the month.

None of these blanks are for "information;" they are used merely as a means of checking the accounts of the stations as against those on the books of the Auditor. The amount remitted to the Treasurer is checked against the account received from the Treasurer's office; the other portions of the report by the books we have described.

The agent remits daily his balance of cash to the bank of deposit of his district, the bank notifying the Treasurer. In making this remittance (which is sent by express, and for which the station holds an express receipt) a blank is used which first requires a statement in exact duplicate of the last previous remittance; and the blank used by the bank informing the Treasurer of the remittance also requires a duplicate of the previous remittance.

Final Disposition of Accounts.—At the close of the month the Auditor, for entry into the journal of the books of the company, makes out a statement of debit and credit balances for each station, made up from the book of monthly freight account. It then becomes a matter of general account, and must be treated as such in the description of these accounts.

It would be impossible to print all the convenient blanks in use in the various operations up to this point, and without them no clear idea may be conveyed of the simplicity and fullness of this excellent method of freight accounts.

The General Accounts—Cash.—The cash book of the company is kept in the office of the Treasurer, who keeps no other accounts than those of records, and who pays no bills or other claims of any kind except upon order of the Comptroller, who at present is Third Vice-President of the Pennsylvania Company. These facts (and possibly they necessarily go together) make the accounting department subordinate to no other. It assumes the final responsibility for the correctness of all claims paid; and is thereby enabled to hold every department accountable for its use of the property and money of the company. It thus becomes a true auditing department of every bill, payment and statement of account. To satisfy the claims of its accounts, the Treasurer must present vouchers, having its signature. To satisfy its claims as to property accounts, shops must show a detailed semi-annual inventory taken *de novo*. All check rolls of labor have passed through its hands, and have been paid on rolls made out by it, and by cash for which it has signed vouchers, which it can demand again as evidence.

For every entry on the general journal there is a voucher in its safe. These vouchers are divided into three classes, Paymaster's vouchers, Treasurer's vouchers and journal entries,† like that which we have described in the final disposition of the freight accounts. Besides these, the department holds the bills on which pay vouchers have been issued.

When a bill is received by the department, a duplicate bill is made out from it, signed as correct by the Paymaster, declared, as to its items, to have been received, inspected and found in good order by the receiving agent, authorized, examined and found correct by the Superintendent of Motive Power (?) for example, examined and approved by the Superintendent of the division, and finally approved by the Manager of the line.

A voucher is then made, stating the point at which the articles are to be used, and certifying that the above account has been duly authorized by the proper officers, that the same has been examined by me (Auditor) and found correct, and that the original bill has been duly registered and filed in the Auditor's office. The voucher is signed by the Auditor, approved by the Comptroller or Assistant Comptroller, and is then a claim on the Treasurer, which may be used as a check in case of necessity.

Finally, the voucher contains a blank receipt which is to be filled out and signed by the parties in whose favor it is drawn on receipt of payment from the Treasurer.

DRAFTS.

Attached to the Comptroller's office is a clerk who keeps books giving a full statement of balances due by or to the Pennsylvania Company. Thus, the book for the Pittsburgh, Fort Wayne & Chicago, has headings as follows: "Amount of Reports" (two divisions, "Other R.R Co.'s," "P., F. W. & C. Ry"), "Balance due" (two divisions, as before), "When paid," "Draft No.," "Remarks." By this book the clerk is able to check any draft, and finding it correct, he stamps it for the Comptroller, who signs it only at the end of the month, when it is returned to the department by the Treasurer. On stamping the draft the clerk marks it on the book as paid. Drafts for balances due the company are drawn by the Comptroller's department from the statements of this book, and their record here entered.

THE JOURNAL AND LEDGER.

All the entries of the Treasurer's cash book are entered upon the journal of the accounting department at the end of the month, but items of various dates are massed so as to appear in detail, but as one aggregate entry.

The Auditor's "Statement of balances to be accounted for by the station agents, conductors, and sundry railroad and other companies, with credits belonging to each on account of the transportation of freight and passengers during the month," forms the source of general journal entry of these accounts.

The general ledger (there are several auxiliary ledgers) is of course the final book of accounts of the company; it is the final balancing of that vast ramification of claims and counter claims involved in conducting railroads of such magnitude as form this branch of the Pennsylvania system.

It was the intention of the writer to have begun these articles with some description of the accounts of the Pennsylvania Railroad proper, but circumstances have necessarily delayed a study of the Pennsylvania Railroad accounts, which, it is hoped, may be made later. C. L. C.

* For the larger stations there is also a blank for daily report, or daily recapitulation of way-bills.

† These last (journal entries) are signed by the freight clerk, passenger clerk ("Examined and found correct" by) general book-keeper ("Examined and approved for record" by) and Auditor.

Papers on Painting.—No. 15.

BY CHARLES L. CONDIT.

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THE A. B. C. SYSTEM.

Messrs. Murphy & Co. protest against the few paragraphs which appeared in last week's article on their "A. B. C." system of painting. Probably the writer was only a little less pained than were they, although for different reasons. The history of the paragraph was as follows:

Many months since, a careful study was made of cars painted by this system, and the conclusions given were then made a part of the article as a record of probable facts, but the writer was not quite satisfied with the investigation nor determined to publish what was written.

This series of articles has as an object the record of the views and experiences of one who has made painting a life-long study.

On reading the paragraph to him, he protested strongly against its publication.

It was therefore carefully stricken out, and it was even supposed by the editor who had charge of the forms that it was not in them.

Since, however, it has appeared, the writer (for himself alone, as this paragraph was entirely his) desires to say that an explanation of the facts (which he expected to ask for when the article was written) has been given to him. Moreover, he has seen other facts which have impressed him favorably with this system, and that he is truly in a state of mind quite unsettled about the matter, and was sorely pained to go prematurely on record.

Every precaution but one (the article had long stood in type) was taken against the appearance of this paragraph.

Messrs. Murphy & Co. cannot be injured if this notice leads to investigation and either refutation or confirmation of the statements by further facts. From the beginning and with increasing evidence, the writer has been impressed with the method as a step in advance and worthy of careful attention.

REPAINTING CARS.

Directions for repainting will be confined entirely to what shall be done after the painter has made his decision as to the method he will follow.

The painter must exercise his own judgment as to frequency of repainting, and whether he shall burn off the old paint or lay new coats upon the old. Repainting often, the latter course will be possible, and if pursued with judgment, it will seldom be necessary to burn off a car. On the other hand, if the period between repaintings is lengthened, burning off the car may become the rule—we do not say the necessary rule. It is not necessary to burn off paint which is not cracked in deep cracks running through a number of coats or to the wood. Merely perished varnish or varnish cracked in fine cracks to the color are no obstacles to repainting. They may even be an advantage. If they are rubbed out, as they can frequently be, a better and more lasting surface for paint will be found below them. It should not be forgotten, therefore, that repainting on such a basis costs about one third less than the removal of the old paint and an entirely new coating.

Let the painter, therefore, count the cost, the saving in the time of the car, and in labor of repainting as against the chances of the work holding out.

We have known of all of the cars of a road being repainted year after year, with excellent results—a burned

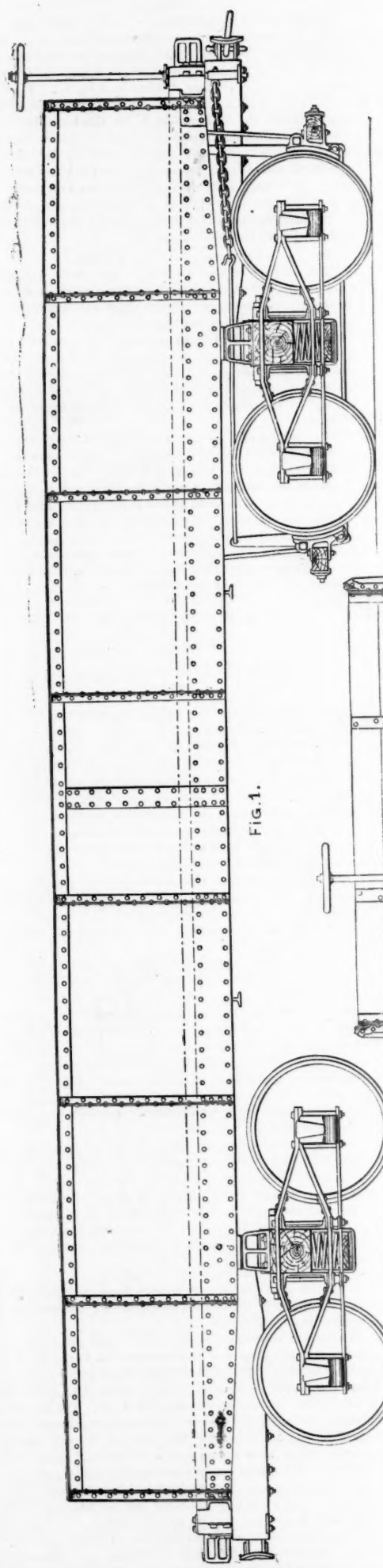


FIG. 1.

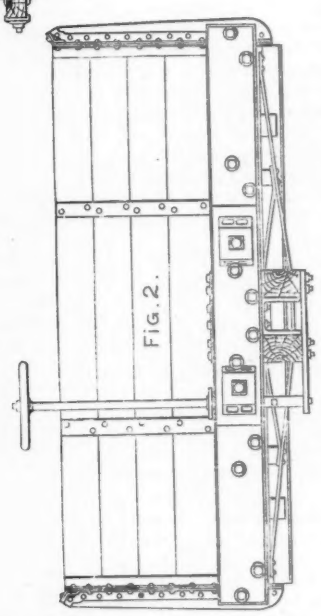


FIG. 2.

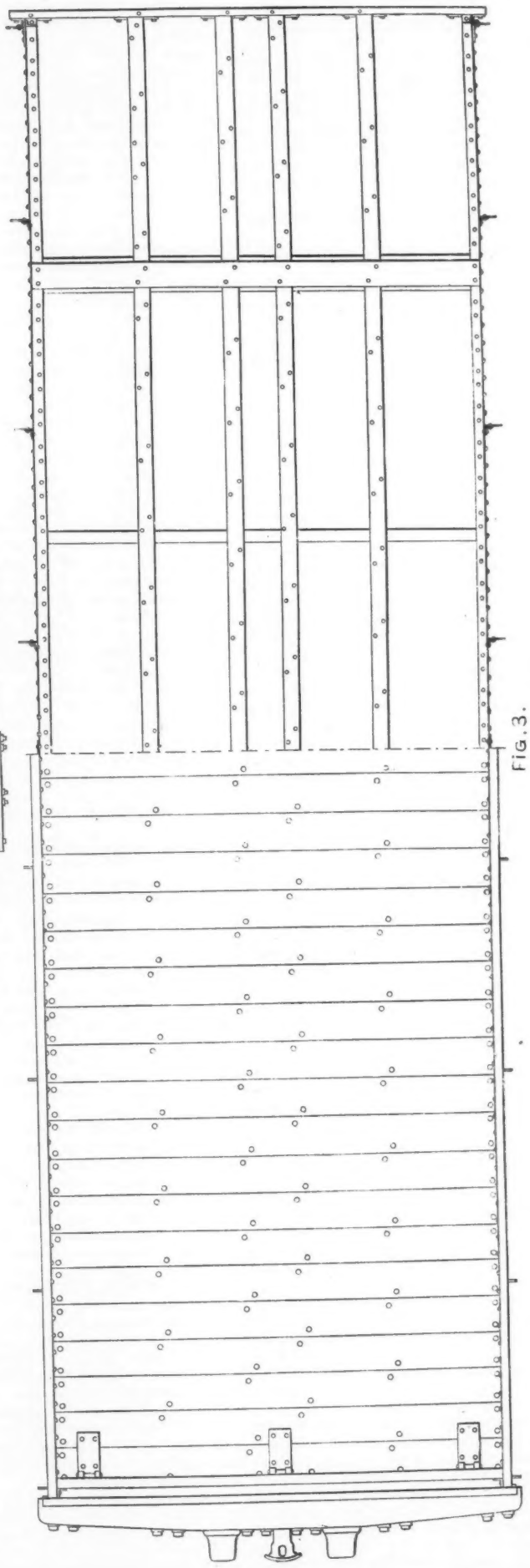
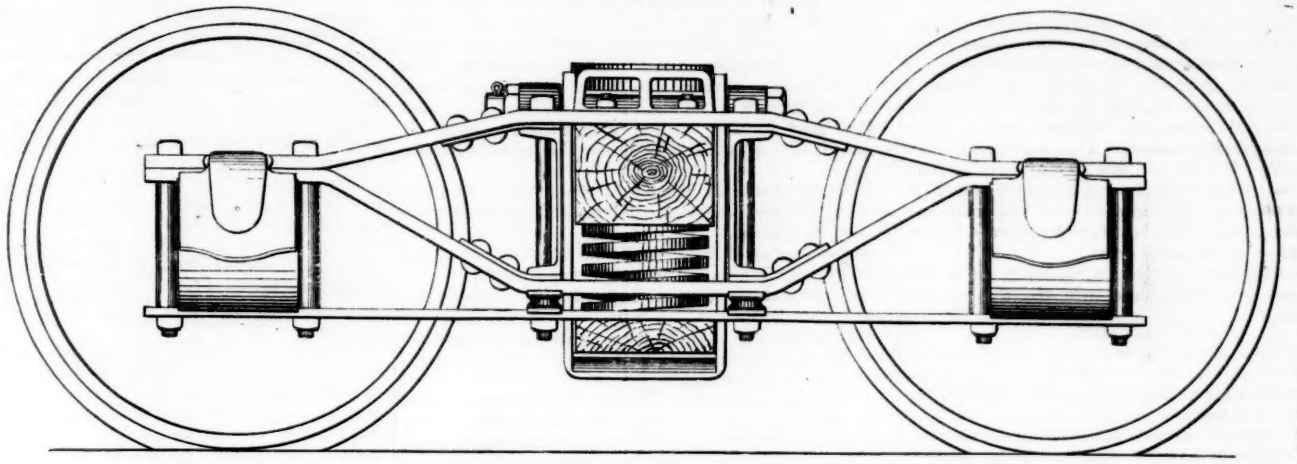


FIG. 3.

KELLOGG'S IRON FREIGHT CAR.

(For description see page 538.)

Fig. 5.



Scale

Fig. 6.

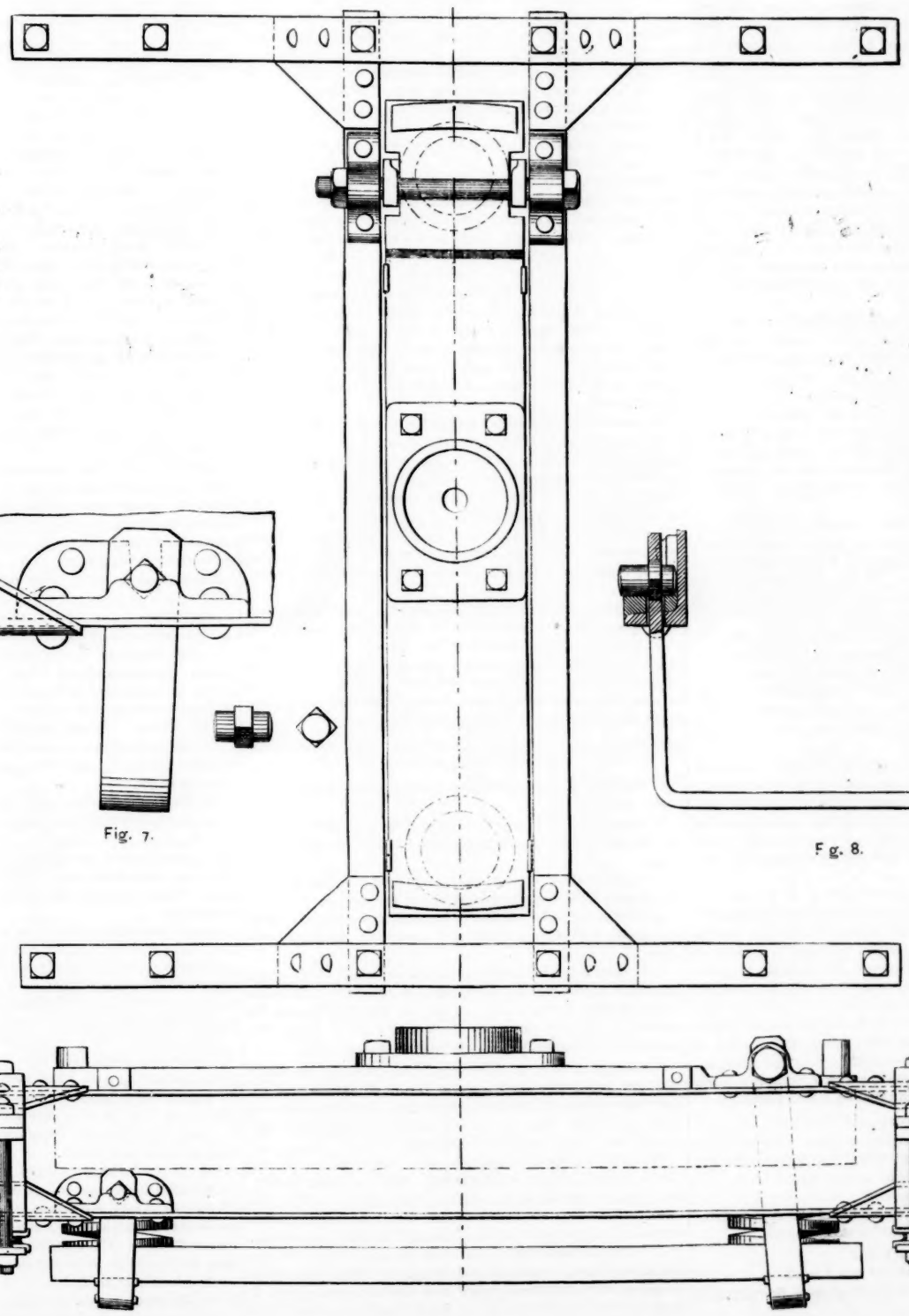


Fig. 7.

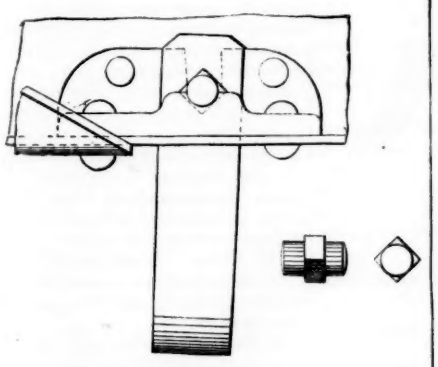


Fig. 8.

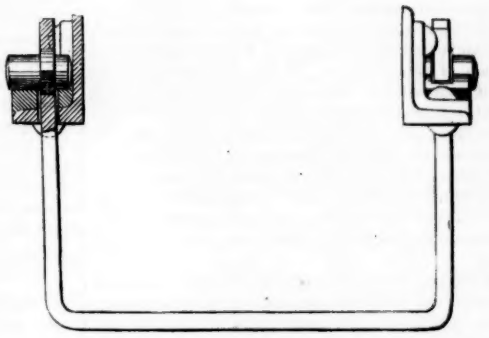


Fig. 9.

KELLOGG'S IMPROVED IRON CAR TRUCK

(For description see page 538.)

off car being an exception, and the appearance of the cars unusually good.

On the other hand, roads which carefully count expense, burn off and repaint very frequently. The matter is one which can only be decided after careful consideration; and we shall express no opinion on the matter further than to say that a system which is based on skill and economy, would naturally seek to save the old paint, since it better protects the wood from moisture. When wood has become very thoroughly dry, it can take up a heavy load of moisture through a thin coat of paint, and crack both itself and the paint above it. On the other hand, new paint over old has greater tendency to crack than over coats of its own age, if they have been properly dried.

The most skilful work is done by repainting on the old foundation, but not every painter will find this the economical method.

REMOVING PAINT.

Burning off by means of hot irons or by gas jets is the common and almost the only method in use in car shops. The use of gas is by far the most economical of the two fire methods, because of the great saving in labor.

Whether a chemical method could be used to more advantage than either of these is a question to be solved

After the paint has been entirely removed, the repainting is in all respects the same as a first painting, with the exception of the priming. Prime with whitelead, oil and terpentine. Considerable differences will be found in the wood of burned-off cars, the priming in some still remaining, in others having disappeared in a considerable measure. This measure has, therefore, to be gauged, and no more priming given to the work than it needs to fill the surface cells without leaving a coating of oil on the surface. Such a coating would endanger the paint above it, and, therefore, it is well to make a previous experiment by lightly priming part of a panel, leaving it over night in order to determine what quantity of oil it will drink in.

The only rule necessary for repainting a burnt-off car is, adapt your priming to the condition of the surface. If already filled with oil, it is only dangerous to add more; if the wood cells contain little oil and will take up more, more is needed. If the surface of the wood remain glossy after the experiment recommended, then add one-half to one-third turpentine to your oil. If the oil on the panel experimented with has been drunk in by the wood, add less turpentine, but in nearly all cases add some turpentine whenever a burnt-off car is to be primed. *Prime the car with whitelead, oil and turpentine, adding a little color if a dark color is to be used as color coats.*

Repainting Over Old Paint.—1. Examine the entire surface of the car carefully, removing all loose paint, especially the loose ridges left bare by shrunken mouldings and panels. If the surface varnish is cracked, it may be best to remove it entirely—*i. e.*, the mere surface varnish.

2. In all cases sandpaper with coarse sandpaper in order to make a tooth in which to give the new paint a foothold. The interior of the scratches made by the coarse sandpaper are softer than the hard, glossy surface, and the new paint will unite better here with the old than it can do on the harder and smoother surface.

This is important—as important as scarifying an old wall before plastering it anew, and for the same reasons.

3. Mix your priming, white lead,* oil and turpentine, to the condition of this surface. If it is dry and hard, add more oil; if it has still the lustre and a little of the softness of new paint, add more turpentine and less oil.

This is the finest point for skill in repainting—to judge of the exact amount of oil needed to make two coats—old and new—unite into one which will not crack the coats above, and yet hold firmly together as one. If much oil is used over an old coat which is still oily—as an English varnish generally is (for example) even after three years, the result will be disastrous.

Even a skilful man cannot always hit this mark, but care and observation will reduce the number of failures to a few. The principle is, unite the two coats—old and new—as only oil can unite them, but use no more oil than is necessary to do this, because if there is oil in the old coat and oil in the new, the result will be a strong coat, which contracting, will injure all coats above it.

This oil gives elasticity to the coat, but it makes it a dangerous one to repaint upon, and for this reason English varnish is more difficult to "hit" in this respect than nearly all American varnishes. The writer, by placing a piece of old paint on end under the microscope, has seen the coats of a frequently repainted car drawn up into gentle waves by the contraction of the stronger varnish. And yet cars may be repainted in such a manner as to last many years without cracking—this being done again and again, until the car is covered by many coats, solid and perfect.† After priming, the car is puttied up and re-surfaced with scraping filler, etc., the entire process being like that of a first painting.

THE INTERIOR WOODWORK OF CARS.

The finish of the interior of cars is a matter of much more importance than that of the exterior. The outside of a car needs a neat protection, the inside simple and tasteful decoration.

Elaborate decoration has its value, but is less appropriate; and is often distasteful if not done by skilled hands.

THE WOOD WORK.

There are three kinds of finish for wood work.

First Coat of Varnish.—Oil finish gives a fine, durable surface.

Fill the wood (see "Wood"), using color, if necessary. If starch dissolved in turpentine is used as a filler, rub it well into the wood with an old brush, let it remain for 15 minutes, and rub off the surface with waste or a rag. Rub across the grain of the wood, and follow strictly the course of the fibres, in order to leave the filler in the pores of the wood. Allow the filler 12 to 24 hours to dry, then give a *spare* coat of good rubbing varnish. Such a varnish should not contain much oil, but be made of the best copal, if possible to get it.

Allow 24 (better 48) hours to dry, and then sand paper with No. 0 paper. Be careful not to cut through the varnish on the corners.

Second Coat of Varnish.—Make this a heavy coat of the same rubbing varnish, and allow it 24 hours to dry.

Then rub with pumice stone and water to a perfect surface.

This surface, well cleaned with oil, gives a good lustre, and the oil in some measure protects the outer coat from overhardening or contracting.

A third coat of rubbing varnish, treated as the second coat (the second coat, of course, getting no oil). gives a still finer surface, but it must be remembered that unless time allows for the thorough drying of each coat, every additional one increases the danger of cracking.

Renewal.—At the end of a half year, it is wise to renew this surface by again rubbing it down with pumice stone and water, and again with raw oil. Or the oil, without using the pumice stone, may be carefully rubbed in (not too much, or the surface will become sticky and dirt-catching). If skilled hands can be spared, this occasional treatment with oil will preserve the varnish, but careless treatment is worse than none, as it is sure to leave too much oil on the varnish. No polish is so good as pure raw oil, sparingly used and well rubbed in.

If the surface is at any time discovered to be cracked, it should be carefully examined, and if the cracking extends only through the outer coat, this may be rubbed off, and oil applied as before.

If a new surface is wished, add another coat of the original varnish, and oil as before.*

The interior varnished surfaces of a large number of cars are more or less badly cracked, and the difficulty lies not in the wood, but in the varnish and the method of applying it. Too quick and hard, and therefore too brittle, varnishes are used. A quick varnish is, however, necessary when rapid work must be done, but such a varnish may easily cost the car a day of its time and the cost of a day's time besides. The expense of rubbing down the inside of an ornamental car to properly remove cracked varnish is worth as much as a day of a car's time estimated at even a high rate. Besides, once removed, so good a surface and finish can never be gotten on the same surface of wood—not, at least, without great labor.

It is the most expensive sort of economy, therefore, the penny-wise-pound-foolish sort, which puts a short-lived, expensive finish on the outside of a car, and a cheap one on the inside. The Purchasing Agent who has his road's interest at heart will look out the very best and most durable "A" selected kauri or copal varnish for the interior of cars. We are glad to say that we know at least one Purchasing Agent who has sought to apply a test to varnish before purchasing, but he belongs to a road on which economy is a first-principle.

But a good varnish hastily applied, one coat on another, and especially applied too often, will surely crack. "If you have good oil," said a great painter of the olden time, "you can make a good picture; and if you have poor oil you can still make a good picture." This is hardly true of varnish; nevertheless, in painting and varnishing, the main things are knowledge and skill and time.

DIRECTIONS FOR THE APPLICATION AND CARE OF VARNISH ON THE INTERIOR OF CARS.

1. Get the best selected Kauri, or, possibly better, good copal varnish.

2. Allow coats all possible time to dry, and plan for this the day the car comes not merely into, but to the door of the shop.

3. A little oil put on by skilful labor once every four or six months will preserve the surface of the varnish.

4. Do not varnish a surface oftener than necessary. Rub out cracks with pumice stone, and apply oil wherever possible.

5. If very much hurried, put on less varnish. Oil the first coat, and let the car go with that, if necessary. If complaint of finish is made, show cause. A second coat can be added on an odd day, but it should bear a family resemblance in composition to the varnish already on.

Patent-Oil Finish (without varnish).—This is in every way the most economical finish for a car, although I am doubtful whether it is so well adapted to their veneers as a varnish. There may be several rich oil finishes (not varnishes under that name) in the market.

Fill as for varnish; 24 hours to dry. Over this put on the first coat of oil; finish with a brush. Allow an hour to dry, and give a second coat; another hour and a third coat. Give three or four coats and rub the last coat with pumice stone and oil (no water used). The job is then completed, and will never need to be done over, for the surface will not crack; the lustre, which is not bright at first, will grow brighter with every new year. For the first two years it may be well to add a coat of finish and rub down with pumice stone, but thereafter nothing will be needed but rubbing down with oil and pumice stone.

* Use either Venetian or Tuscan red in place of the whitelead, as priming. If Tuscan red is to be used as color, Indian red under Tuscan red will darken it.

† Twenty coats of paint in 30 years have been put on a car, and no cracks perceptible.

* If the varnish has had much oil, it is better to rub down with pumice stone before giving the new coat.

Kellogg's Iron Freight Car.

At each annual meeting of the Master Car-Builders' Association, the qualities and probabilities of the iron car are discussed, but the standing committee on this subject are unable to present a satisfactory report, owing to the scarcity of material to select from. Still, while they (the Association) appear to consider it to be almost a certainty that the next important move will be in this direction, each company prefers that the other should be the first to start. This is due greatly to the fact that almost without exception such iron cars as have been built or exhibited in models, plans or otherwise, have combined a multitude of new features entirely foreign to the subject; and while one member may sanction one new invention, he would object to the others, leaving the car as a whole unsatisfactory, and giving the impression that iron cars require an entirely new construction.

But there is no reason why the same general form of construction in iron may not be employed that has been found by experience to give the best results in timber, adapting it to such shapes of brakes, draw-heads, springs, etc., as each consumer desires; and why, when a casting is required, we cannot duplicate the one now used for that purpose, enabling it to be replaced from stock if necessary; and in looking the car over, each Master Car-Builder will recognize parts whose ability to fill the requirements has been demonstrated beyond doubt.

The engraving herewith presented is designed for a 25-ton gondola, with drop ends, suitable for a coal or ore traffic one way and timber or merchandise the other. Its general dimensions are:

Length over end sills, 30 ft.; width outside of sills, 8½ ft.; height of box (inside), 3 ft., with a capacity of 826 cubic feet of coal. Entire weight, with double brakes, 9 tons net. The four inside sills are of solid rolled beams, spaced in relative positions to the timber sills in the ordinary car. Outside sills are of angle irons riveted to the siding—No. 8 tank iron—by which arrangemement we obtain an increased depth of sill and a greater bearing or riveting surface to the stakes. Along the top of the box is riveted an obtuse angle iron, which, in addition to affording the same resistance to deflection as the ordinary angle iron, will not be as liable to bend out of shape from falling coal, gives a more satisfactory construction to the upper end of the stakes and adds a finish to the car. Stakes are each made of an angle iron stiffened by a plate on edge riveted to the projecting arm, the other arm riveted to the sill, siding, and formed over the angle at the top. The body-bolster (fig. 4), while being slightly altered from the usual shape, is worthy of notice. The intention being to place the entire weight on the centre plates, using the side-bearings only to steady the body, it is essential that the bolster should not settle, which can be effectually accomplished by supporting each sill directly, as shown on engraving. The additional price of iron is more than offset by dispensing with the cast-iron separators now used. Flooring is of Norway pine secured to sills by oval-headed bolts spaced as shown. End sills of oak of the usual pattern bolted through the iron channel end-sill. Draw-head timbers start from and are fitted into the bolster castings receiving their bolts; along the bottom flanges of centre sills are riveted projections 1¼ in. by the full width of the sill, which fit into corresponding notches cut into these timbers. This arrangement relieves the outside bolts from all shear and tendency to enlarge the holes in the timber, being simply to hold the timbers up against the iron sills, and offering a secure attachment which may be readily replaced if necessary. Buffers may be of the pattern shown, or of any shape desired.

The advantages of a car of this build, combining strength with lightness and freedom from decay, are briefly stated by Mr. Charles Kellogg, the designer, to be:

"1. Its durability, as if kept painted it remains uneffected by time or climate, and all repairs resulting from decay and rot will be avoided.

"2. This 25-ton car, weighing but 9 tons, the proportion between the capacity and dead weight is increased from 1.9 to 2.7, equal to a reduction of nearly 36 per cent. in the amount of dead or non-paying freight. As I appreciate the fact that percentages can frequently be more easily given in theory than obtained in practice, I will give in detail the procedure.

"Assume a line moving ten trains daily consisting of 45 cars each, with 20 tons, or a total tonnage of paying freight of 9,000 tons, and of dead weight (at 10½ tons each) 4,725 tons. To haul this freight in 25-ton cars, weighing 9 tons, will require 360 cars with a total dead weight of 3,240 tons, being a decrease of 90 cars and 1,485 tons of dead weight.

"Or, instead of 10 trains of 45 of the modern cars, 9 trains of 40 cars (of iron), each will earn the same profit, or one train less in ten, with 1,485 tons less of dead weight.

"Again, the number of wheels, burrs and other wearing parts will be proportionately reduced; less space on sidings, in yards and freight depots will be required, and fewer trains, crews and power.

"As to the first cost, cars of this pattern can be furnished at the same price per ton of capacity as the best modern 20-ton car, which is the true estimate of their value, as no one would presume to obtain a 60-ton engine at the price of one of 40 tons. The cost being equal per amount of freight they will earn, the economy in their use is derived from—

"1. Their increased life.

"2. Decrease in number of trains to move the same freight.

"3. Decrease in haulage of non-paying freight (from 2.79 to 1.9).

"4. Decrease in repairs and liability to accidents due from decay of timber."

Figs. 5 to 9 represent the improvements which have been

made by Mr. Kellogg in the well-known Thielsen truck, and which he proposes to use with his iron car. The following is his description of this truck:

"As wrought-iron channels are rapidly entering into use for cross-frames of freigat car trucks, it becomes advisable to determine the most suitable means of connecting them with the side or diamond frames, upon which their entire stability depends.

"Channel-bar cross frames have been in use for about 11 years, and until within two years were confined to one make or design, and gaining fair results, therefore having no competition, came largely into use. But since then two other designs have been brought forward leaving three distinct channel trucks to select from. In these all parts may be the same, the only difference being in this one detail, 'the manner of connecting the cross and side frames;' therefore the relative cost of each is as the proportion between each in this one detail; which, while being the only means of keeping the truck square and in shape, does not add an iota to its carrying capacity, but just the reverse. And if the result heretofore accomplished with 568 lbs. of wrought and cast iron in one design, and 396 lbs. of cast iron in another can be obtained with 96 lbs. of wrought iron, the advantage is apparent. It is true that cast iron for this purpose has largely been employed, but note at what cost.

"The most expensive design is that used exclusively by the lines operated by the Vanderbilt interests, in which two auxillary bars 3 × ¾ in. start from the bottom of each oil-box on one side until the nearest channel is reached, thence along and bolted to the bottom flange of the channel, and from there to the oil-box on the opposite end of the same axle from which it started. Also four cast-iron brackets, each with an additional truss bolt.

"In another design, this service is performed by two cast-iron end or head pieces, but very heavy, and rivited to each channel at their ends; but not being attached to the side-frames in any shape, the stability lies entirely in the strength of the truss bolt holes, which is not excessive. In the truck represented herewith, the two frames are connected by eight wrought-iron gusset or stay plates ¾-in. thick, through which the truss bolts pass, and rivited to each flange of the channels, arch and truss bars, making them practically one piece. As before stated, upon this one point depends the ability of the truck to retain its shape, and being liable to sudden and severe shocks, aside from the question of cost, it requires but a slight knowledge of metals to judge of the superiority of wrought over cast iron.

"To be sure, these cast-iron connections have been used exclusively and satisfactorily, as the main object seems to be to keep the truck in shape while on the track, but what shape will it present after a short journey on the ties? Also, we can all bear in mind the time when cast-iron bridges were and had been in use for years, but when wrought iron became available it required but a slight insight on the part of engineers to determine its advantage. Again, it is possible that cast iron can be used to answer the purpose, and it may be that those in use may, but can the railroads afford the cost, which is as follows. Of the three, the relative weight and cost per car are as follows:

On the Vanderbilt lines ...	568 lbs. wrought and cast iron @3c.	= $15.23
The Thielsen	396 lbs. cast iron @ 2c.	= 7.92
The Kellogg	96 lbs. wrought iron @ 4c.	= 3.84

"Of the former, there have been put in use about 4,000 cars; and if, as some of those using them, but having no power to change, claim, the latter will give better results, the loss to this one system, or the relative cost of 4,000 pairs of trucks, is $48,560, determined as follows:

Of the 1	$60,920
Of the 2	31,680
Of the 3	12,360

"Again, there is the cost of hauling this excessive dead weight, aggregating 27 per cent. of the entire weight.

"If desired, the ornamental name-plates may be used; it is designed to fill in between the ends of the channels to give a finished appearance, and serve as a name-plate for railroads and dates of patents. It is simply a shell, and bolted to the ends of channels. There are also two methods of suspending the swinging parts, one in the usual manner by long hangers resting on journal-boxes, riveted to top-flanges of channels; and the other by short hangers (9 in. long) suspended from bearings resting on and riveted to the bottom flanges. When this is used, it is advisable to place the channel with the broad flange underneath. While this method has been approved generally, some have expressed doubts as to the ability of this flange to sustain the loads; but in addition to the strength of the metal we have also that of two rivets through the web. The pins are made from 1½-in. square iron with ends turned down to 1⅝ in., and the hangers, having square holes, will insure the wear being confined to the journals instead of the hangers. Also, the square corners prevent the pin from leaving its place, as to remove it it is necessary to jack up the sand plank.

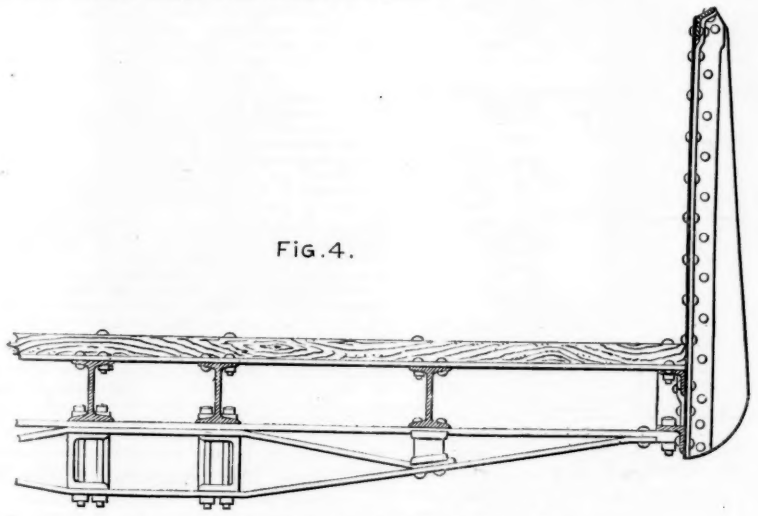
"The saving in material will be easily determined, as there are no top pins, and some 7 ft. less in length of hangers, aggregating about $2.50 less in cost per car.

"This detail can be used on any channel-bar truck. The advantage to the user is this: All who have had occasion to remove the interior parts will bear in mind the difficulties attending it. After jacking up the cars, it is necessary to clamp the spring-beam and sand plank together to relieve them of the pressure from the springs, before the top pins can be relieved. With this short hanger it is only necessary to relieve the truck from the weight of the car body, and the interior work can be readily removed.

"These trucks are no experiment, but have been in successful operation under coal cars, with 33-in. sides, for nearly a year, with no outlay for repairs."

Those desiring further information are referred to Mr. C. H. Kellogg, of Buffalo, N. Y., who is the owner of the patents.

Fig. 4.



KELLOGG'S IMPROVED IRON CAR.

Joint Executive Committee Passenger Meeting.

The statement of "differential rates" made in our last issue, as adopted by the Joint Executive Committee last week, was erroneous. It was taken from a New York daily paper just before going to press and when there was no time to verify it. The figures there given were those which were proposed Wednesday and printed for the convenience of the meeting, but they were at no time adopted. The meeting continued in session until late Saturday, almost wholly occupied in discussing differences in rates. After full discussion it was left to Mr. Fink to fix the rates, which will be found appended, together with the resolutions passed at the meeting, as given in a circular from Mr. Fink's office, dated Aug. 26:

PROCEEDINGS.

The following is the larger part of the official report of the proceedings:

The following roads were represented:
Baltimore & Ohio, C. K. Lord.
Boston & Albany, E. Gallup.
Canada Southern, W. H. Hurlburt.
Cleveland, Columbus, Cincinnati & Indianapolis, A. J. Smith.
Delaware & Hudson Canal Co, D. M. Kendrick.
Fitchburg, J. Whitmore.
Indianapolis & St. Louis, A. J. Smith.
Lake Erie & Western, G. W. Smith.
Lake Shore & Michigan Southern, John Newell, W. P. Johnson.
Louisville & Nashville, C. P. Atmore.
Marietta & Cincinnati, T. P. Barry.
Michigan Central, H. B. Ledyard, O. W. Ruggles.
New York Central & Hudson River, H. J. Hayden, E. J. Richards.
New York, Lake Erie & Western, Jno. N. Abbott.
New York & New England, A. C. Kendall.
New York, Pennsylvania & Ohio, A. E. Clark.
Ohio & Mississippi, W. B. Shattuc.
Pennsylvania, Frank Thomson, J. R. Wood.
Pennsylvania Company and Pittsburgh, Cincinnati & St. Louis, E. A. Ford.
Rochester & Pittsburgh, E. A. Holbrook.
Vandalia Line, E. A. Ford.
Wabash, St. Louis & Pacific, H. C. Townsend.

After a full discussion of the difficulties that prevented the carrying out of the St. Louis agreement, and the subject being referred back to the St. Louis Committee for settlement, the Committee proceeded to determine the differential fares, eastbound and westbound, between the cities of Boston, Albany, New York, Philadelphia, Baltimore, Washington, Cincinnati, St. Louis, Chicago, Louisville and Nashville, the result of which is contained in Circular No. 398, given below.

The following action was taken by the Committee with reference to theatrical fares:

DIFFERENTIAL FARES TO APPLY TO ROUTES ONLY UPON WHICH THEY HAVE BEEN ESTABLISHED.

"*Resolved*, That differential fares shall apply to routes agreed upon only, and that full tariff fares shall be charged over all other routes for all classes of tickets from date of adoption of differentials; also that regular tariff fares shall be charged to intermediate points."

STATISTICAL INFORMATION TO BE FURNISHED THE COMMISSIONER.

"*Resolved*, That members of the Committee furnish to the Commissioner statements of the number of passengers and the revenue derived from business between the several differential fare points by the various routes for each month of the years 1881 and 1882, as far as they can be compiled, and to continue said statements monthly, at the close of each month's business; such statements to be kept private by the Commissioner for the present, but to be used ultimately for the purpose of ascertaining the operation of the differential fares as compared with previous periods, with the view to future adjustment."

DIVISION OF EARNINGS.

On motion, it was agreed that the award of percentages for division of passenger earnings will be postponed until next meeting.

Adjourned to Tuesday, Oct. 3.

ALBERT FINK, Chairman.

R. T. BRYDON, Secretary.

CIRCULAR 398.

Differential Passenger Fares.

At the meeting of the Joint Executive Committee (Passenger Department), held at its office in New York, Aug. 22 to 26, 1882, differential passenger fares, as shown in accompanying table, making part of this circular, were agreed upon, and the following resolutions were adopted:

Resolved, That the differential first and second class, and theatrical fares between Boston, Albany, New York, Philadelphia, Baltimore, Washington, Cincinnati, St. Louis, Chicago, Louisville and Nashville, decided upon by the Commissioner, and made a part of the proceedings of this meeting, shall take effect and be in force on and after Sept. 1, 1882, and it is hereby understood and agreed to by the members of the Joint Executive Committee, that on and after that date the payment of commissions on first or second-class and theatrical tickets, or orders for tickets at or between the points above mentioned, shall cease, and no commissions shall be paid at or between any other points which may affect the rates decided upon as above by the Commissioner, directly or indirectly; except as more particularly specified and under the conditions named as follows:

I. No commission shall be paid from differential-fare points to any other differential or intermediate point.

Commissions may be paid as follows:

II. On business from intermediate points to differential-fare points.

III. On business from differential-fare points to points beyond other differential-fare points.

IV. On business between intermediate points and other intermediate points.

V. On business betwen intermediate points and points beyond differential-fare points.

Provided that such commissions shall not be paid by initial lines, or to any persons except the regularly authorized ticket agents, and also provided that the commission so paid do not affect in any way the business which differential fares are intended to equalize, and provided that such commission shall not be used by the ticket agents to reduce the the fares

Resolved, That it is the sense of this Committee, and the Commissioner so rules, that "putting differential fares into effect" provides that such fares by the several routes shall be named and offered to passengers by the selling lines.

Resolved, That the differential fares may be advertised at the points only where such fares are operative; it being understood and agreed that they shall not be used as a means of advertising the advantages or disadvantages of any line against others, and that therefore any advertising shall be confined to a simple statement of fares and the accommodations furnished by each route, for the information of passengers, leaving to them the choice of routes.

Resolved, That differential fares shall be operative only between points named in annexed table, and shall not be used by connections for basing purposes; it being the intention of the committees to adjust fares from points affected by these differentials at the earliest possible day, and for that purpose connecting roads are requested to inform the Committee, through the Chairman, of any adjustment which may seem to them necessary or desirable.

Resolved, That local committees be constituted at each of the points from and to which differential fares have been decided upon, to consist of the general passenger agents of the initial roads or their local representatives, for the purpose of considering and, if possible, settling any differences which may arise at those points, under these resolutions; it being understood that these local committees shall submit to the Commissioner, any questions which they are unable to settle, and await his decision before any party shall be permitted to take action contrary to the spirit of this agreement.

ALBERT FINK, Chairman.

R. T. BRYDON, Secretary.

Between	1st class.	2d class.	Theatrical.
Cincinnati and Boston:			
N. Y., P. & O. and Erie	$19.00	$17.00	.....
Buffalo & N. Y. Cen.	20.00	17.50	.....
Cincinnati and Albany:			
N. Y. Pa. & O. and Erie	16.00	15.50	.....
Buffalo and N. Y. Cen	17.00	15.50	.....
Cincinnati and New York:			
N. Y., Pa. & O. and Erie	16.00	15.00	$13.60
M. & C. and B. & O	17.00	15.50	14.00
C. C. C. & I and N. Y. Cen. or Erie	17.00	15.50	14.00
P. C. & St. L. and Penna	18.00	16.00	14.40
St. Louis and Boston:			
Wabash and N. Y. Cen	25.25	21.75	.....
Ind. & St L. and N. Y. Cen.	25.25	21.75	.....
O. & Miss., N. Y., Pa. & O. and Erie	23.25	20.75	.....
C. & A. and L. E. & W.	23.25	20.75	.....
St. Louis and Albany:			
Wabash and N. Y. Cen	23.25	19.75	.....
Ind. & St. L. and N. Y. Cen.	23.25	19.75	.....
O. & M., N. Y., Pa. & O. and Erie	21.25	18.75	.....
C. & A. and L. E. & W	21.25	18.75	....
St. Louis and New York:			
Vandalia and Penna	24.25	20.25	19.40
Wabash and N. Y. Cen	23.25	19.75	19.00
Wabash and Erie	22.00	19.00	18.50
Ind. & St L. and N. Y. Cen.	23.25	19.75	19.00
Ind. & St. L. and Erie	22.00	19.00	18.50
O. & M. and B & O	22.00	19.00	18.50
O. & M., N. Y., Pa. & O. and Erie	20.75	18.50	18.00
C. & A. and L. E. & W	20.75	18.50	18.00
St. Louis and Philadelphia:			
Vandalia & Penna	22.75	.....	.....
O. & M. and B. & O	21.00	.....	.....
St. Louis and Baltimore or Washington:			
Vandalia and Penna	20.25	.....	.....
O. & M. and B & O	20.25	.....	.....
Chicago and Boston:			
P. F. W. & C. and Erie	20.50	18.25	.....
Mich. Cen. and N. Y. Cen	22.00	19.00	.....
Lake Shore and N. Y. Cen.	22.00	19.00	.....
Chicago and Albany:			
P. F. W. & C. and Erie	16 65	15.40	.....
Mich. Cen. and N. Y. Cen.	18.15	16.15	.....
Lake Shore and N. Y. Cen.	18.15	16.15	.....

Between	1st class.	2d class.	Theatrical.
Chicago and New York:			
Mich. Cen. and Erie	18.50	16.00	15 40
Lake Shore and Erie	18.50	16.00	15.40
Grand Trunk and Erie	18.50	16.00	15.40
P. F. W. & C. and Erie	18.50	16.00	15.40
Mich Cen. and N. Y. Cen.	20.00	17.00	16.00
Lake Shore and N. Y. Cen.	20.00	17.00	16.00
Baltimore & Ohio	18.50	16.00	15.40
P. F. W. & C. and Penna	20.00	17.00	16.00
Chicago & Philadelphia:			
Baltimore & Ohio	18.00	.....	.....
P. F. W. & C. and Penna	18.25	.....	.....

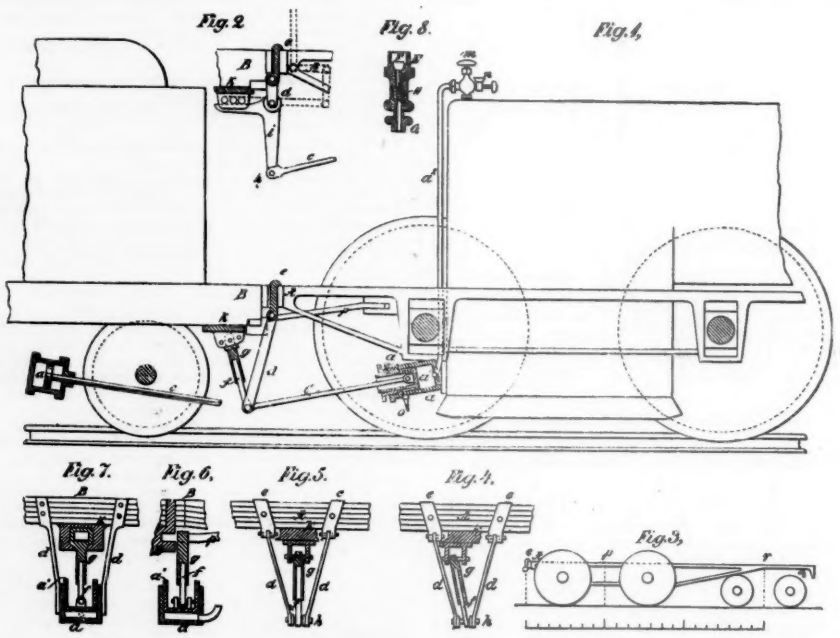
Differential fares between points on the Louisville & Nashville and eastern points named in this table will be based on the Cincinnati fares quoted above.

The Pennsylvania Railroad accepts the fares named between St. Louis and Chicago on the one hand and Philadelphia, Baltimore and Washington on the other, *temporarily*, protesting that fares between St. Louis and Baltimore should be less by the Pennsylvania Railroad than by the Baltimore & Ohio.

Waterman's Locomotive.

Mr. Henry Waterman, the veteran locomotive engineer, of Hudson, N. Y., has patented an improvement in locomotives by which a portion of the weight of the tender may be thrown on the driving wheels. This device is now extensively used in the Boston & Albany Railroad, so that much of Mr. Waterman's specification will be of great interest to many readers. A considerable portion of it is therefore given without abridgement. In it the inventor says:

"As early as the year 1837 locomotive engines were in use in which the front end of the tender was made to bear upon the rear end of the engine. This was effected by means of a screw which passed through the rear of the foot board into the back end of the draw-bar that connected the engine with the tender so that when the screw was turned it would force the front end of the tender upward and communicate a corresponding force downward upon the rear of the engine. These locomotive engines had but a single pair of driving-wheels.



WATERMAN'S LOCOMOTIVE.

Wedges and blocks have been used in place of the screws above mentioned. Again, draw-bars have been used placed at a considerable angle—that is to say, with the front end considerably higher than the back end, so that when a pulling force is applied to it it will lift the front of tender and press downward upon the engine. This force will be in degree in accordance with the degree of angle of the bar and amount of pull.

"The lifting of the tender by means of screws or equivalent devices is defective and impracticable for the following reasons: It communicates its force in a permanent manner, and is used to as great an extent upon a level grade, where it is not required, (in proportion to the draft of the engine), as it is in ascending grades, where it is required, and does not provide for the great variation of weights that occur in practice. For instance, when the tender is loaded with fuel and water it is vastly heavier than when this load is removed. The weight of the fuel and water is generally considered to be about equal to the weight of the tender itself, so that a permanent connection would vary in force about from minimum to 100 per cent.

"The use of the angular draw-bar for the purpose of adding to the weight upon the driving-wheels is in practice defective for the following reasons: It is not of a positive character and must depend upon the degree of adhesion pre-existing. For instance, if the wheels have commenced to slip, they will glaze their surfaces, and thereby lose from 30 to 35 per cent. of their adhesion, which the angular bar cannot restore. Again, the angular bar is not in the least degree operative when the motion of the engine is reversed, for when the angular bar is used for the backward motion it will produce a positive loss of adhesion, as it pushes down upon the tender and up upon the engine; and as the sand-boxes and sand-pipes are not placed in the rear of the driving-wheels, when the engine is called upon to exert all of its available force to back up the train neither the angular bar nor the sand can assist, the former being a positive damage.

"It is an important feature of my invention that it can be applied in anticipation of the immediate want of additional adhesion, which will tend to prevent the slipping and glazing of wheels, so that the greatest amount of adhesion can be attained.

"My method of applying additional weight or downward force to the driving-wheels of a locomotive engine at the required times and in the degrees required is accomplished by attaching a steam-cylinder to the boiler, or to the frame of the engine beneath the foot-board or floor of the cab, or to the frame of the tender beneath the floor thereof, and connecting this cylinder to the steam-chamber of the boiler by means of a pipe with a stop-cock or valve placed therein and within easy reach of the person in charge. This cylinder, when in action, may be charged with steam from the boiler, or it may be connected by a pipe to the air-chamber used in connection with air-brakes, to be charged with the pressure of the compressed air contained therein, it having a piston or plunger and a connecting-rod that connects it with a system of links, studs, and their joints, so arranged that the steam or compressed air will communicate an upward force to the front of the tender and a downward force to the rear of the engine, and, through the frame of the engine, an additional force to the driving-wheels, such force being augmented by the rising or tendency to rise of the front end of the engine, this downward force upon the driving-wheels being positive and entirely independent of the pull or push of the engine upon the draw-bar or other parts.

"It is important that the point where the weight is applied at the rear of the engine should be as near the back end of the frame as possible, so that the augmented downward force shall be as great as possible. By referring to fig. 3 it will be seen that, if the distance between e and p is one-half the distance between p and r, each pound placed upon e will produce a downward force of one and a half pound upon p and an upward force of half a pound at r.

"My invention is specially or best adapted to what is called the eight-wheel engine, having two pairs of driving-wheels at the rear and two pairs of common wheels at the front, although it can be used, though at a less advantage, on the six-wheel engine.

"It will be observed that there are several modifications of my invention shown, all, however, embodying the same principles of action and producing the same result. The crudest form is shown in figs. 6 and 7, in which the cylinder is suspended to the back cross-bar of the frame of the engine. This cylinder is so placed that by means of the piston a', which has a joint in it sufficiently free, the stud $f\ g$ is allowed to vibrate with vibration of the tender. The stud $f\ g$ is a direct connection between the piston and the back end of the draw-bar, so that the upward force will be communicated to the draw-bar, and from it to the front end of the tender. If the cylinder is carried farther back, the stud may be made to bear upward against a shoe piece, like k, fig 1.

"The modification shown in fig. 2 consists in substituting a lever or bell-crank in place of the links and stud. This form is in its action the same as that shown in fig. 1. This lever may be changed by placing the long end horizontally and applying a cylinder and piston, acting vertically upon its long end; or the amount of weight transferred to the engine by the hand of the engineer or fireman may be effected by means of a series of cranks, links, and rods, arranged substantially as shown in said figure.

"In constructing and applying my improvements to a locomotive I employ, when steam is used as the motive power, a cylinder a, of such dimensions as may be required, and by preference attach it to the boiler under the foot-board of the engine, as when it is placed in such position the heat from said boiler has the effect to prevent the water of condensation from becoming frozen therein. Within the cylinder a there is placed a piston or plunger a', the former being preferred on account of its being more readily packed, which is forced outward by means of steam admitted between it and the head of the cylinder through the steam-pipe a^2, the upper end of which is connected with a cock or valve m, which communicates with the steam-space of the boiler, it being supplied with a supplemental valve n, through which oil may be introduced for lubricating the piston a'.

"For the purpose of communicating the movements of the piston to the mechanism which applies a portion of the weight of the tender to the engine, there is connected to said piston or plunger a connecting-rod c, the opposite end of which is connected to two swinging rods or links $d\ d$, and to a jointed stud, consisting of the parts f and g, the upper end of which is in this instance secured to a bracket k, attached to the frame-work of the tender, to which bracket the stud is pivoted in such a manner as to permit it to swing thereon. The upper ends of the links $d\ d$, above referred to, extend upward from their pivotal points h to brackets e, or to a single one which is firmly bolted to the rear end of the frame A of the engine, they being pivoted to said bracket or brackets so that their lower ends may swing freely as the piston a' moves in its cylinder.

"The arrangement of the above-named parts is such that as steam or compressed air is admitted into the inner end of cylinder a, the piston or plunger a' will be forced outward and cause the connecting-rod c, to be moved rearward, the effect of which will be to press upward upon the stud, and through it upon the forward end of the tender, a portion of the weight of which will be transferred through the links $d\ d$ to the rear end of the engine and through its frame to the driving-wheels.

"It will be observed that the amount of weight transferred, as just stated, will be in proportion to the distance the piston is made to travel in the cylinder up to the time when the weight of the front end of the tender is carried by the engine, or up to the time when the stud $f\ g$ reaches a vertical position; and it follows as a consequence of this arrangement that the amount of weight or force thus transferred may at all times be regulated by the operator and by the amount of steam or air admitted to the cylinder. It is also apparent that the augmentation of the direct weight or force that is applied to the rear end of the engine will be in proportion to that thus applied, its action being clearly shown by the diagram herewith presented.

"When it is found desirable to use compressed air only for causing the requisite movement of the piston or plunger a', I contemplate placing the cylinder under the floor of the tender, such an arrangement being shown in fig. 1. The only change required in order that it may be so placed is the provision of the necessary frame-work for supporting it in position, the operation of all the other parts being the same whether pushed into operation by the rod C or drawn by said rod, as in the case under consideration.

"The modification shown in fig. 2 is the same in principle as that shown in fig 1, the difference in construction consisting in the use of a bell-crank lever i, for transferring the weight to the engine, in place of the stud $f\ g$.

"The transverse sections shown in figs. 4 and 5 are designed to illustrate the provision which is made for the oscillation of the tender upon the track, fig. 4 showing the stud in an inclined position, such as it assumes when the center of the tender is not in line with the center line of the engine, and fig. 5 showing it in a vertical position.

"The modifications show a plan for attaching the cylinders directly to the frame of the tender, in which case the steam or air cylinders are placed vertically, they being provided with pistons and rods, the latter constituting the portion f of the stud $f\ g$. The construction of this stud is as follows: The part g consists of a socket, the upper end of which is attached to a bracket or a shoe-piece k, secured to the frame of the tender, while the part f consists of a rod the lower end of which is secured to and held in position by the links $d\ d$ or by ears formed on the pistons a'. The construction and arrangement of this device is such that when the tender is loaded and the apparatus is not in use the upper end of the part f is forced up to the upper end of the cavity in the part g, at which time they together form a thrusting-rod, when the motion of the tender vertically will in moving downward force the part f down, which will have the effect to cause all of the parts, including the piston in the cylinder, to be carried into a proper position for use.

"When the construction and arrangement of the parts illustrated in figs. 6 and 7 are used there is provided a shoe-piece k, to which the upper end of the stud $f\ g$ is secured by means of a bolt which forms a joint for the stud to work upon, the shoe-piece being provided with a series of holes for the bolt to enter, by which means the degree of downward pressure or force can be regulated to any extent desired, as the stud in this case receives the thrust directly upon its upper end, and it follows that when it is placed at a greater or less elevation its action upon the tender will be controlled by its position.

"The device shown in fig. 8, as above stated, is a relief-valve or water-trap, it consisting of a tube E, the upper end of which is provided with a screw-thread for securing it to the cylinder, with the interior of which it communicates. Said upper end is also provided with a valve F, which opens inward, it being provided with a stem which enters an aperture formed in the tube, its lower end resting upon a spring H, placed in the lower end of the tube. For the purpose of regulating the action of this valve, there is placed in the extreme lower end of the tube E a hollow set-screw G, upon which the lower end of spring H rests. In practice, the screw G is turned upward to such an extent that it will require, say, 80 or 90 pounds pressure in the cylinder to open it, said pressure serving to keep the valve closed so long as the apparatus is in use, it being opened by the spring when the steam is shut off, said opening affording means for the escape of the water of condensation."

The claims are as follows:

"1. The hereinbefore-described method of placing upon the driving-wheels of a locomotive an amount of weight not due to the weight of the engine, it consisting in combining with the frame of the engine and the tender a cylinder and piston, a connecting-rod, pivoted oscillating links, a supporting vibratory stud, and a shoe-piece for supporting the upper end of said stud, substantially as set forth, and for the purpose described.

"2. The combination of the frame A of the engine, the brackets e, links $d\ d$, the elongating vibratory stud $f\ g$, a shoe-piece k, having different holes or joints for connecting it with the upper end of the stud, a piston-rod c, steam or air cylinder a, and piston a', the parts being arranged for joint operation substantially as set forth.

"3. The vibratory supporting-stud $f\ g$, constructed and arranged substantially as shown and described, whereby it is made to aid in transferring a portion of the weight of the tender to the driving-wheels of the engine, and in returning the parts to their proper positions for reapplication by the admission of steam or compressed air to the cylinder a, substantially as set forth and described.

"4. The shoe-piece k, constructed as shown, it having a series of holes or joints for regulating in different degrees the amount of weight to be placed upon the engine, substantially as set forth.

"5. The pivoted oscillating links $d\ d$, in combination with the rear cross-bar of the frame of an engine, their upper ends being arranged at such a distance from each other as to allow the free vibration of a draw-bar between them, and their lower ends so near to each other as to form a central point upon which a portion of the weight of the tender may rest, substantially as shown."

THE SCRAP HEAP.

Working a Train.

A lady who lives in this city, and is well known here, had something of an experience on an Erie train a few nights since, though fortunately neither loss nor harm resulted. She left Buffalo Saturday on the night express, which leaves here at 9:20 in the evening. At an early hour Sunday morning, when the train was somewhere between Susquehanna and Port Jervis, as she lay curled up on the seat, wearied and drowsy with the night's journey, a man entered the car and dropped into the seat behind her. Unfolding a newspaper, he leaned forward, with his arms on the back of the seat occupied by the sleeping woman, as if to read. Presently he dropped his paper upon her. Under pretense of regaining it, he attempted to find the pocket of her dress. A slight movement on her part frightened him off, but he soon repeated his tactics, getting his hand into her pocket. Before he could secure whatever might have been there, the woman turned about and apparently went to sleep, with her pocket where he couldn't get at it. Baffled, the "train agent" crossed the aisle and dropped into a seat in front of a demure-looking German woman. Feigning drowsiness, he sank back heavily towards her, with his arm on the back of the seat. As she seemed quite unconscious, he reached out for her pocket. While still fumbling about, the Buffalo

woman was awake and watchful, but the brakeman entered the car and the pickpocket at once left. In reply to inquiries by the lady from Buffalo, the German woman quietly said that she saw what the fellow was at, "but," with a laugh, "dot pocket haf noddings in, so I led him fumble for fun."—*Buffalo Express.*

An Electric Railroad Motor.

Mr. W. M. Thomas, of Cincinnati, has invented a new electric railway and electro-motor for the same. The electric current is supplied from a stationary generator to two copper wires laid between ordinary rails, a few inches apart, and a trifle higher than the rails. The wires are protected by an iron tube, to which they will be attached by proper insulators. In this tube or pipe is an upper and lower slot extending its full length, the lower slot being the wider so that dirt falling on the wires may pass through and the wires be kept clean and protected from interference. The other distinguishing feature of Mr. Thomas's invention is the motor, which has five wheels, the two forward ones being simply an ordinary truck, serving merely as supports, as on an ordinary locomotive. The rear pair are larger, as ordinary driving wheels, and through them the power is applied. Back of them is the fifth wheel, somewhat wedge shaped, and divided by an insulator of gutta percha, so that either side touches the wires before described, through which the current flows, and swinging lightly, both laterally and perpendicularly, in order to turn curves easily or more easily to pass over possible depressions or elevations in the conductors. Directly above this wheel is the electric cut-off, moved back or forth by a lever, for the reversing of the current and consequent reversal of the motion of the car. The details of taking up the current from one conducting wire, then passing it to the motor and from that to the conductor, the power being in the meantime transmitted to the drivers by ordinary mechanism, are ingenious, and, it is claimed, have many advantages over previous appliances. The new points are the laying of the conductors and in the construction of the electro motor, by which the secondary current, which has always before seriously interfered with its working, is said to be reduced to about one-eighth of what it has heretofore been. A model on a small scale has been exhibited and works well. The crossing of tracks and the necessary changing of switches, which have been found very serious obstacles, are overcome by Mr. Thomas by the use of flexible cables at those points, which, passing under and over one another, furnish the needed connections.

An English Fast Channel Steamer.

The London, Chatham & Dover Railway Company have placed a new steamer in the channel service, for passengers and mails between Dover and Calais. The new boat, named the "Invicta," made her first run from Dover to Calais and back in one hour and 12 minutes. This is a quicker run by 12 minutes than the fastest made hitherto by any of the company's ships in this line. It is expected that she will make the run regularly in an hour and a quarter, which, compared with what was done 20 years ago, when the passage was made in two hours, shows a considerable advance in the shipbuilder's art.

The dimensions of the new ship are: Length, 312 ft.; breadth, 33 ft.; draught, 8 ft. 6½ in.; burden, 1,647 tons. Her engines of over 4,000 indicated horse-power have two oscillating cylinders, 80 in. in diameter, with 6 ft. 6 in. stroke, working with 30 lbs. pressure of steam.

Car Building Extraordinary.

The *Journal*, of Monday, Aug. 7, contains an announcement of the achievement of two car carpenters from Lambertville, who had succeeded in completing a six-ton coal car in less than ten hours. Mr. Dennis, foreman of the (New Jersey Central) shops, informed the Lambertville mechanics that he had secured the services of two carpenters from Pennsylvania who could perform the same amount of labor in six hours. The Lambertville boys, anxious to beat their previous record, went to work on Tuesday to make their mark.

While the work was in progress, the Master Car-Builder said that he would be satisfied if they accomplished the task in eight hours. They succeeded in finishing their job in six hours and 28 minutes, which is a feat that has never been performed at the Central shops.

Mr. Dennis is now awaiting the appearance of two men from the Keystone state to see what they can do in six hours. He has had considerable experience in car building, and thinks the timeabove alluded to can be beaten, although doubts are entertained in regard to it.

Considerable interest is naturally manifested in the shops in relation to the car-building contest, and the mechanics in the several departments have temporarily stopped talking about the war in Egypt and the strike on the bob-tail lines, and may possibly indulge in wagers as to whether Lambertville or Pennsylvania mechanics are the most proficient.—*Elizabeth (N. J.) Journal.*

How Mexico Celebrates a Railroad Opening.

We have received a copy of the programme of the celebration which is to be held in the town of Chihuahua, capital of the state of the same name, which indicates that the Chihuahuans look upon it as a great event, which to them it certainly is. The following is a translation:

"Great is the joy and enthusiasm shown by the people in the interior of the country now that they are expecting the arrival of that civilizing artery known as the railroad, which connects us with people of other countries, no matter how far they may be, and puts us in contact with progress in all the branches of public wealth.

"This great event impels Chihuahua to be happy, and to rejoice herself during eight days of fair or festivities, which shall commence from the day when the supreme authorities of the state shall lay the last rail, which may confirm the arrival of the locomotive to this city—a day of satisfaction and great emotion for the whole state.

"In order to solemize duly such happy event there will be prepared for those eight days illuminations, popular festivals, theatres, acrobats, concerts, horse-races, military parades, music in the parks, serenades at night, balls and entertainments, all kinds of games permitted by law, and everything that the municipal corporation may provide in order to manifest the joy of these days.

"As soon as the date or day when the official reception shall be fixed it will be observed in the following order:

"First—At dawn of the day named the national flag shall be hoisted, which shall be saluted by minute guns, a general ringing of bells, and bands of music promenading the streets.

"Second—At 10 o'clock of the same day there shall assemble at the government house all the public functionaries, generals and officials of the federation, the City Council, public officers, and all those distinguished persons of the city who may be invited, for the purpose of forming the suite which shall accompany the Chief Magistrate to the place destined for the reception.

"Third—As soon as the company is assembled and organized by a committee appointed for the purpose, the Governor shall occupy the chair: a column of artillery shall open the march, and a column composed of the federal forces garrisoning the town shall close it, each with their respective bands. In this order they shall march to the place designated at the end of the railway, where a pagoda and a stand shall be erected.

"Fourth—The government of the state shall appoint the orator, who shall pronounce the official address, leaving the stand at the disposal of any person who may wish to occupy it.

"Fifth—On concluding this ceremony the concourse shall return in the same order, where it shall disperse.

"Sixth—In the evening of said day two bands of music shall play, one in the Alameda and another in the garden of the main square of the city; renewing the firing of salutes at the time of lowering the national flag.

"Seventh—On the night of the same day the City Council shall order that two balls take place with all the magnificence possible, a popular ball, which shall take place in the Portales de la Plaza de Armos, and the other in the Teatro Bentancourt, where the invitations shall be through special tickets to all the supreme authorities of the state, chiefs, officers, and officials of the railway, as well as to all persons whom the respective committee shall deem proper to invite.

"Eighth—In the ensuing seven days all the amusements and other festivities shall continue to take place as indicated above in this programme."

A Stock Company.

It was on the line of the Q. & M. railroad in Michigan; a railroad traveler rushed into the eating house and called for quail on toast.

"Sorry, sir, but quails are out of season," was the reply.

"Any partridge?"

"None."

"Any turtle soup?"

"Just out of soup, sir."

"Any spring lamb?"

"No spring lamb."

"Any spring chicken?"

"Served the last yesterday."

"You must have roast beef?"

"No roast beef."

"Any leg of mutton?"

"No, sir."

"Well, what have you got?"

"Coffee, corned beef and sandwiches, sir."

"And you call this a first-class eating house!"

"No, sir, this is an eating-house run by a stock company. Some want spring chicken on the bill of fare, and some say that ham is good enough, and so the cook splits the difference and sets out corned beef. Don't speak so loud, sir, as the stock-holders are in the other room, and have presented a resolution to buy 50 pounds of chickory per month to brace up our coffee."—*Free Press.*

LOCOMOTIVE RETURNS, MAY, 1882.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

Name of Road.	Miles operated	Locomotives in service	Mileage. Total	Mileage. Average per engine	Miles Run To. Ton of coal	Miles Run To. Cord of wood	Miles Run To. Pint of oil	Average Train. Passenger cars	Average Train. Loaded freight cars	Cost in Cents per. Passenger car mile	Cost in Cents per. Freight car mile	Cost per Mile in Cents for. Repairs	Fuel	Stores	Miscellaneous	Engineers, firemen and wipers	Total	Average Cost of. Coal, per ton	Wood, per cord
Allegheny Valley, River Div.*	139	37	94,477	2,553	33 18	.....	19 41	3.20	14 19	7.584	0.805	8.71	4.40	0.58	.....	6 45	20.14	$	$
Low Grade Div.*	120	22	47,641	2,166	29.60	.....	17.50	2.60	13.40	2.885	0.864	1.10	4.20	0.70	.....	6.60	12.60	.....	.....
Buffalo, Pitts. & Western*	174	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central Pacific, Western Div.‡	200	29	82,834	2,856	48.75	.....	15.39	.....	.....	.....	.....	8.92	21.90	0.58	0.31	7.99	29.80	6.50	4.60
Northern & San Pablo Divs.†	104	33	97,291	2,949	38.39	.....	16 81	.....	.....	.....	.....	6.32	17.00	0.53	0.3	7.19	31.21	6.5	4.60
California Pacific Div.†	179	12	28,437	2,370	48.16	.....	29 14	.....	.....	.....	.....	4.82	13.54	0.35	0.83	7.73	27.27	6.50	4 60
Sacramento Div.†	119	43	100,024	2,324	.....	24 80	23.12	.....	.....	.....	.....	7.22	18.54	0.47	0.37	8.88	35.43	.....	4.60
Truckee Div.†	205	26	72,212	2,777	30.52	91.70	18.26	.....	.....	.....	.....	5.31	15 82	0.4	0.38	8.04	24.63	6.50	4.60
Humboldt Div.†	209	21	66,214	2,829	43.70	.....	21.74	.....	.....	.....	.....	4.87	14.90	0.42	0.32	7.74	28.2	6 5	4.60
Salt Lake Div.†	219	30	97,262	3,107	31.18	.....	16.28	.....	.....	.....	.....	5.45	20.87	0.54	0.2	7.33	34.19	6 50	4 60
Oregon Div.†	151	7	23,532	3,362	.....	48.42	24.59	.....	.....	.....	.....	1.40	10.60	0.40	0 08	6.99	19.47	.....	4.60
Stockton & Copperopolis†	49	3	5,40	1,800	.....	71.35	34 62	.....	.....	.....	.....	1.48	6 48	0.25	0.33	6.66	14.60	.....	4.60
Visalia Div.†	157	19	52,269	2,751	31.74	.....	19.34	.....	.....	.....	.....	10.84	24.36	0.45	0.05	7.27	42.97	6.50	4.60
Tulare Div.†	170	26	71,561	2,754	26.50	.....	15.19	.....	.....	.....	.....	4 90	33.42	0.62	0.40	8.17	47.46	8.96	5.25
Los Angeles, San Diego & Wilm. Divs.†	167	23	69,064	3,004	29.01	.....	14.31	.....	.....	.....	.....	4.00	22.83	0.64	0.28	6.9	34.66	8.9	5.25
Yuma Div †	249	29	107,045	3,69	44 30	.....	13 9	.....	.....	.....	.....	3.28	21.61	0.62	0.28	6.9	32.71	8.9	5.25
Gila Div.†	248	23	94,832	4,123	47.13	.....	16.63	.....	.....	.....	.....	3.32	18.95	0.53	0.15	7 4	30.95	8.95	5.25
Tucson Div.†	209	24	93,909	3,121	34.61	.....	14.42	.....	.....	.....	.....	2 49	25.78	0.59	0.48	8.3	37.55	8.9	5.25
El Paso & Rio Gr'de Divs.†	402	33	116,541	3,532	46.7	.....	15.95	.....	.....	.....	.....	1.54	19.11	0.53	0.24	7.56	28.98	8.9	5.25
Chi. & Eastern Ill., Main Line‡	169	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Terre Haute Div.‡	65	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland & Pittsburgh*	225	76	193,902	2,551	42.13	.....	15.87	4.25	17.74	4.400	1.010	5.64	3.60	0.67	.....	6.37	16.28	1.45	3.10
Dela., Lacka. & Western, Bloomsburg Div.‡	80	27	78,978	2,924	.....	.....	29 97	.....	.....	.....	.....	2.06	.....	0.59	.....	4.6	7.27	.....	.....
Erie & Pittsburgh*	98	28	69,904	2,467	33 70	.....	12.79	3.20	18.40	4.657	0.960	2.85	5.33	0.70	1.01	7.1	17.03	1.75	1 78
Grand Rapids & Ind., Main L'e	332	53	153,327	2,987	36.05	34.85	17.21	.....	.....	.....	.....	2.95	8.72	0.18	4.96	5.51	22.7	3.35	2.50
Cin., Rich. & Ft. Wayne	92	22	31,399	1,427	37 07	.....	17.12	.....	.....	.....	.....	1.86	8.69	0 57	3.21	5.72	19.46	.....	.....
Illinois Central, Chicago Div.‡	365	89	244,907	2,752	36.88	.....	15.91	5.43	21.02	.....	.....	4.94	4.71	0.27	.....	5.44	15 36	1.65	3.15
Middle Div.‡	101	18	21,598	1,200	43.20	.....	19.28	1.74	11.69	.....	.....	1.17	2 9	0.32	.....	4.75	10.49	1.6	3.05
North Div.‡	345	56	121,948	2,178	39 80	.....	13.12	3.85	13.61	.....	.....	4.8	5.75	0.31	.....	5.98	16.57	1.65	3 15
Springfield Div.‡	113	11	27,822	2,529	28 54	.....	9 6	2.04	12 84	.....	.....	2.22	3.84	0.28	.....	5 18	11.52	1.4	2.95
Iowa Div.‡	401	42	116,231	2,767	30.33	.....	17.98	3 9	12.2	.....	.....	3.87	8.3	0.24	.....	5.8	18.26	2.4	5.00
Jeff., Madison & Indianap.*	226	42	114,980	2,737	40.55	.....	14 94	3.29	22.73	3.690	1.020	3.55	7.14	0.42	1.57	5.95	18.6	2.70	4.35
Kan. City, St. Jo. & Coun. Bl ¶	247	38	121,216	3,190	47.90	.....	22 08	4.19	17.26	.....	.....	6.20	4.70	0.30	.....	6.10	16.30	2.9	3.50
Lake Shore & Mich. Southern.																			
Buffalo Div.‡	....	86	178,078	2,070	36.7	.....	26.91	.....	.....	.....	.....	3.66	7.25	0.26	.....	6.09	17.28	2.6	5.69
Erie Div.‡	....	128	272,625	2,129	32.26	.....	30.34	.....	.....	.....	.....	5.87	7.2	0.28	.....	5.9	19.24	2.5	5.43
Toledo Div.‡	....	94	186,617	1,98	28.34	.....	23 2	.....	.....	.....	.....	5.17	9 50	0.28	.....	6.4	21.4	2.67	4.08
Mich. Southern Div.‡	....	229	544,151	2,358	38.53	100 80	20.57	.....	.....	.....	.....	3.69	8.14	0.3	.....	6.1	18.29	3.1	4.68
Little R'k, Miss. Riv. & Texas.	155	14	24,238	1,73	.....	6.50	10.00	.....	.....	.....	.....	3.69	4.1	0.70	2.05	6.23	16.78	.....	4.60
Louisv'e & Nash., First Div.**	455	61	146,752	2,405	31.16	....	11.87	5.92	17.88	2.95	1.410	3.1	6.4	0.41	1.6	6.52	18.17	1.97	4.30
Second Div.**	200	25	65,480	2,631	31.07	.....	14 7	4.64	15.86	3.24	1.90	2.32	5.94	0.38	1.65	6.55	16.87	1.83	2.54
Memphis Div.**	130	16	43,295	2,706	26.07	.....	16.29	4.35	19.67	3.15	2.140	5.89	6 92	0.36	1.62	5.9	20.72	2.46	2 50
Nash. & Decatur Div.**	122	23	65,021	3,601	27.21	.....	14.86	3.93	11.15	4.190	1.690	3.45	6. 4	0.35	1.16	6.47	17.7	1.6	2.30
South & North Ala**	189	39	104,475	2,67	26.87	.....	14 91	3.95	5.12	3 880	1.320	5.33	6.16	0.42	1.18	5.81	8.89	1.6	2.56
Mobile & Montgomery**	187	37	68,858	2,549	40.27	.....	16.58	5 58	16.58	3.220	1.130	3.45	6.13	0.36	1.6	6.23	17.51	2.49	1.90
St. Louis Div.**	207	33	85,129	2,579	41.50	.....	16.26	2.13	1 4 1	3.860	1.280	3 27	3.01	0.32	1.1	5.79	13.57	1.12	3.00
Ev., Hen. & Nash. Div.**	135	36	85,812	2,384	25 91	.....	14.15	2.77	14.97	2.330	1.350	7.87	5.2	0.29	1.65	6.25	21.41	1.33	1.50
New Orleans Div.**	141	26	62,557	2,406	52.70	.....	18.00	4 91	13.98	2 900	1.210	6.49	5 19	0.27	0.92	6.02	18.89	3.2	1.58
Pensacola & Selma Divs.**	134	26	28,397	1,092	42.40	.....	17.52	.....	9 51	.....	1.79	4.0	5.21	0.33	0.72	6.9	17.18	2.61	1.90
Louisv., Cin. & Lexington**	225	38	113,020	2,974	39 24	.....	17.17	4.7	13.3	3.230	1.380	3.14	6.24	0.36	1.39	6.54	17.67	2.37	3.10
Marquette, Hough. & Ont.	83	34	84,655	2,49	38.86	.....	26.16	.....	40.87	.....	.....	1.52	9.85	0.47	.....	5.63	16.94	3.5	...
N. Y., Pa. & O., Eastern Div.	225	92	267,296	3,146	29.80	.....	14.74	6.50	23.4	.....	.....	2 89	7.09	0.58	.....	6.16	16.72	2. 6	2 95
Western Div.	197	68	213,884	3,149	37.5	.....	19 93	6.30	18.10	.....	.....	3.26	7.21	0.47	.....	5.9	16.80	1.93	2.95
Mahoning Div.	141	57	160,466	2,81	32 28	.....	17.69	3.50	23.9	.....	.....	3.25	6.20	0.46	.....	5.71	15.62	2.04	2.95
No. Cent., El. & Can. Divs.	147	49	117,244	2,393	27.29	.....	17.86	.....	.....	.....	.....	3.71	5.95	0.66	.....	6.23	16.55	1.60	1 84
Ohio Central	231	42	130,375	3,104	32.64	.....	19 65	.....	.....	.....	.....	2.25	3.69	0.39	.....	5.31	11 67	.....	.....
Pennsylvania, N. Y. Div.††	120	128	434,669	3,396	31.21	.....	9.09	.....	.....	.....	.....	6.00	11.3	1.10	.....	.....	17 4	3.26	3.75
Amboy Div.††	214	50	119,655	2,393	45.87	.....	14.9	.....	.....	.....	.....	5.00	7.00	0.70	.....	.....	12.70	3.2	3.76
Belvidere Div.††	80	42	76,933	1,832	31.25	.....	13.39	.....	.....	.....	.....	13.50	10.30	0.70	.....	.....	24.5	3.26	3.77
Philadelphia Div.††	290	177	554,548	3,132	24.75	.....	10.66	.....	.....	.....	.....	4.6	5.10	1.00	.....	.....	10.70	1.2	2.88
Middle Div.††	182	97	317,226	3,270	22.18	.....	11.93	.....	.....	.....	.....	4.51	5.70	0.70	.....	.....	1 .90	1.20	2.88
Altoona Div.††	56	26	50,817	1,955	4 .60	.....	15.72	.....	.....	.....	.....	3.30	2 90	0.70	.....	.....	6.90	1.2	2.88
Pittsburgh Div.††	172	204	556,512	2,728	26.16	.....	11.13	.....	.....	.....	.....	4 70	4 60	0.90	.....	.....	10.20	1.2	2.88
Tyrone Div.††	162	47	118,985	2,532	18.01	.....	14 16	.....	.....	.....	.....	8.00	6.70	0.70	.....	.....	15.40	1.2	2.88
West Penn. Div.††	104	22	43,890	2,131	35.66	.....	31 25	.....	.....	.....	.....	2.70	3.50	0.30	.....	.....	6. 0	1.20	2.90
Lewistown Div.††	63	10	21,189	2,019	24.35	.....	17.92	.....	.....	.....	.....	6.70	5.00	0.50	.....	.....	12.20	1.2	3.02
Bedford Div.††	57	4	9,136	2,034	48.45	.....	17.9	.....	.....	.....	.....	1.80	2.50	0.60	.....	.....	4.90	1.20	3.12
Frederick Div.††	109	11	25,295	2,291	31.73	.....	24 04	.....	.....	.....	.....	1.7	4.00	0.50	.....	.....	6.20	1.20	2.88
Monongahela Div ¶	54	14	36,617	2,187	40.09	.....	12.72	.....	.....	.....	.....	1.90	3.00	0.70	.....	.....	5.60	1 20	2.94
Phila., Wil. & Baltimore, Maryland Div.††	98	70	212,404	3,034	44.90	.....	9.96	.....	.....	.....	.....	2.80	6.20	0.80	.....	.....	9.80	2.60	3.92
Central Div.††	87	18	43,763	2,431	38.81	.....	10.59	.....	.....	.....	.....	3.20	7.20	0.70	.....	.....	11.10	2.60	3.92
Delaware Div.††	97	21	42,384	2,018	40.73	.....	11.60	.....	.....	.....	.....	4.00	6.10	0.6	.....	.....	11.30	2.60	3.92
Pitts., Ft. Wayne & Chicago, Eastern Div.*	468	175	491,976	2,811	37.83	.....	12.71	5.40	17.70	2.486	0.892	2.45	4.49	0.67	1.70	6.71	16.02	1.70	1.70
Western Div.*	280	122	414,914	3,401	35.84	.....	16.50	6.87	22.87	2.110	0.749	3.77	4.79	0.52	.....	6.10	15.18	1.70	2.24
Pitts., Cin. & St. Louis, Little Miami Div.*	197	44	154,633	4,511	40.27	.....	15.48	4.81	19.26	3.351	2.870	11.90	5.44	0.52	2.94	5.69	26.49	2.15	1.65
P., C. & St. L. Div.*	247	103	245,638	2,385	29.58	.....	18.60	6.34	22.31	2.200	1.110	8.38	4.29	0.54	3.26	5.87	22.34	1.20	2.90
West Jersey††	163	23	62,360	2,712	33.28	.....	11.39	.....	.....	.....	.....	4.20	12.20	0.90	.....	.....	15.30	3.40	3.93
Year ending May 31:																			
Chi. & Northwestern	3,033	558	14,157,257	32,540	20.51	.....	7.39	5.23	24.02	.....	.....	4.14	8.80	0.69	.....	.....	20.51	2.51	2.71

* Five empty cars rated as three loaded ones.
† Switching engines allowed 6 miles per hour; helping engines, actual distance run.
‡ Switching engines allowed 6 miles per hour.
§ Fuel not estimated.
‖ Two empty cars rated as one loaded one.
¶ Three empty cars rated as two loaded ones

** Switching engines allowed 6 miles per hour; five empty cars rated as three loaded ones.
†† Engineers', firemen's and wipers' wages not included in cost.
The ton of coal is 2,000 lbs., unless otherwise noted; 25 bushels counted to the ton.
Repairs generally include all shop expenses.

Train Accidents Report—A Correction.

In our record of train accidents in July there appeared the following:

"On the afternoon of the 22d a passenger train on the Boston & Providence road was thrown from the track in Canton, Mass., by a misplaced switch. The cars were nearly upset and somewhat damaged."

Superintendent A. A. Folsom informs us that no such accident took place on his road, and that the report must have originated in some mistake.

He Was Willing to Be Put Off.

A justice of the peace in the interior of Michigan had a case before him some days ago, in which the defendant, who had been arrested as a suspicious character, and plead guilty to vagrancy, was sent to the Detroit House of Correction for six months. A constable took him in charge to deliver him here, and as the man seemed rather pleased at the idea of securing board and lodgings for six months, he was not handcuffed. As the train was about ready to go the constable moved across the aisle to talk politics with a friend, and pretty soon they were having it hot and heavy. When the conductor came in for tickets he held out his hand to the prisoner, and the latter shook his head and replied:

"I don't pay fare."

"Aha! You don't, eh? Well, now, you pay or git!"

"I won't pay!"

"Then you'll git! When we slow up at the crossing you jump off. If I find you on the train after we pass there I'll give you a bounce that you won't forget!"

In two minutes the train began to slow, and the prisoner walked to the door and picked a soft spot and dropped off. When the train had made another mile the conductor held out his hand to the constable and received two tickets.

"Who is the extra one for?" he asked.

"For the prisoner over there."

"What prisoner?"

"Why, that fel—— !"

Then there was raving and gnashing of teeth and hurrying up and down, but it was no use.

"Sorry," said the conductor, as he passed along, "but when a passenger says he won't pay fare on my train I give him the drop. The only thing that surprised me was to see how willingly he obeyed orders."—*Detroit Free Press.*

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

RAILROAD EARNINGS IN JULY.

For the month of July, our table of earnings has reports from no less than 68 railroads—the largest number yet. These roads had in the aggregate 51,020 miles of railroad this year, which is nearly half of the total in operation in the United States, and 5,967 miles, or 13.2 per cent., more than they were working in July last year. Their aggregate gross earnings were $30,019,504, which is $2,726,766, or 10 per cent., more than last year; and their average earnings per mile *decreased* from $606 to $588, or 3 per cent. Among the companies which do not usually report their earnings, or have not done so regularly, are the Evansville & Terre Haute, the Louisville, New Albany & Chicago, the Ohio Southern, the St. Paul & Duluth, the Utah Central, and the Vicksburg & Meridian, all of which show a large increase in earnings. Of the 68 roads reporting, only 14 show a decrease in total earnings and 27 a decrease in earnings per mile, notwithstanding which, as we have said, there was a decrease in the *average* earnings per mile.

There is an unusual number of very large increases, but as usual most of them are on new roads or lines which still have light earnings per mile, and there is no large system of roads among them. The lines whose increases per mile have been more than 20 per cent., and those whose decreases have been 16⅔ per cent. or more, and their earnings per mile this year, are:

Increase:	P. c. of inc.	Earn. per mile.	*Decrease:*	P. c. of dec.	Earn. per mile.
Evansv. & Terre Haute.	84.0	$759	Central Branch..	45.5	$150
St. P., Minn. & Man	83.5	837	Denver & R. G..	28.0	465
Ohio Central.....	55.1	369	Mo., Kan.& Tex.	27.0	392
Belleville Line...	50.3	580	Ill. Cen., Ia. lines	22.0	333
Houston, E. & W. Tex..	44.5	205	St. Paul & Omaha	21.6	316
Peoria, Dec. & Ev.....	38.8	290	Little R. & Ft. S.	19.2	155
St. Paul & Duluth.....	36.0	555	Cen. Iowa .'....	19.0	375
Chic. & Grand Trunk...	37.0	405	Int. & Gt. North.	19.0	253
Buff., Pitts. & West....	33.5	371	Chic.,Mil.& St.P.	18.5	337
Cleve., Akron & Col	32.2	274	Ind.,Bloom.& W.	17.5	296
Marquette, H. & Ont ...	26.0	2,216	Gr'n B.,W.&st.P	17.5	122
Mil., Lake Shore & West.	23.6	246	Vicksb. & Merid.	16.3	187

While there is the same number of companies on each side, those having increases worked but 3,133 miles in the aggregate, while those having decreases worked 10,729 miles.

Only three of the roads with large increase had more than the average earnings per mile ($588). Of these the Evansville & Terre Haute shows an astonishing increase. The Manitoba has gained similarly for several months past, and the Marquette & Ontonagon has an unprecedented iron ore traffic over its short line.

Ten roads with large decreases have all without exception less than the average earnings per mile, and generally very much less. There are enormous differences in these earnings per mile, as will be seen below, where we give the ten with the largest and smallest:

Largest:	Per mile.	*Smallest:*	Per mile.
Marquette, H. & O....	$2,210	Green Bay, W. & St. Paul.	$122
Pennsylvania.....	2,139	Central Branch	150
Reading.....	2,039	Tol., Cin.& St. L.....	152
Northern Cen.....	1,564	Wis. Cen.....	153
Manitoba.....	837	Little Rock & Ft. S.....	155
Long Island.....	834	Vicksburg & Meridian.....	187
Chic. & Alton.....	793	Ohio Southern..	199
Missouri Pacific.....	785	Ala. Gt. Southern	210
N. Y. New England.....	780	St Louis & Cairo.....	234
Ev. & Terre Haute... ..	759	Gulf, Col. & S. F.....	239

The Manitoba is the only new road among those with largest earnings per mile; while the Little Rock & Fort Smith, the Vicksburg & Meridian, the Alabama Great Southern and the St. Louis & Cairo are the only ones with very small earnings per mile which are not new, or with a large amount of new road.

It is too early to see any considerable effect of the new crops on earnings. In July wheat and oats might have been marketed on Southern roads, but the grain crops there are chiefly consumed at home, and we see that the Texas roads and the roads that carry from Texas generally show a considerable decrease in earnings, as do the Little Rock & Fort Smith, and the Vicksburg & Meridian. The other Southern roads generally have some increase, considerable on the Cincinnati Southern and the Louisville & Nashville; but not elsewhere. The only other roads that might have carried a considerable freight from the new wheat crop are the Missouri Pacific, the Atchison, Topeka & Santa Fe, the Wabash and a few smaller ones, which do not gain largely. They felt the new crop generally only during a week or two of the month. They must have felt it all through August, and some of the weekly reports have shown it.

On the other hand, the roads north of the winter wheat region probably had in July the lightest grain traffic for many years. The old grain was nearly all gone, and the new crop not ripe. Thus such roads as the Northwestern, the Milwaukee & St. Paul, the St. Paul & Omaha, and the Iowa lines of the Illinois Central show a considerable decrease in earnings. If these latter depended on grain alone, and were not stimulated by the heavy immigration and the demand for supplies consequent on good crop prospects, they would have shown a much larger decrease. And the lines named, and those in their latitude, hardly begin to feel the movement of the new crop in August, and not very strongly, under ordinary circumstances, until the latter half of September. If the stocks of wheat in the East and Europe were very light, then the crops of Iowa, Minnesota and Dakota would be hurried forward, doubtless; but the large winter wheat crop, harvested, much of it, six weeks earlier, has prevented any such eager demand, and the price for present delivery is not so much higher than that for delivery in future months as to induce the farmer to make haste in threshing and marketing. It may then be some time yet before the Northwestern roads get any considerable benefit from the fine crops now harvested or being harvested.

July was the first month for nearly a year that the trunk lines received paying rates for through westbound freight, and their revenue from this must have been much larger than in previous months, though perhaps not so great as in the corresponding month of last year, when the rates were higher than this year and the traffic considerably lighter. This traffic, however, does not make a very large proportion of the total earnings of any of the roads reporting, and especially in July, which is the month of lightest westbound movement. The advance probably had considerable effect on the Pennsylvania, which carries a quarter of the shipments from New York, most of those from Philadelphia, and a smaller portion of those from Baltimore and Boston. It shows a considerable gain for the month, as do the Northern Central, the New York & New England, and the Chicago & Grand Trunk; but most of the gain must have been due to other causes.

Below we give our usual table of earnings per mile for six successive years:

July Railroad Earnings for Six Years.

	1877.	1878	1879.	1880.	1881.	1882.
Ala. Gt. South.....	.....	.....	$113	$164	$199	$210
Atch., Top. & S. F.....	$266	$420	460	470	602	594
Burl., C. R. & Nor.....	178	245	249	292	309	320
Central Iowa	256	283	....	...	467	375
Central Pacific...	741	728	637	758	721	674
Chesapeake & O.....	....	322	399	548	517	593
Chic. & Alton.....	451	639	639	844	807	793
Chic. & East Ill.....	365	442	418	519	568	649
Chic., Mil. & St. P.....	394	440	438	330	413	337
Chic. & N. W...	499	561	609	682	708	612
Chic., Minn. & Om ...	....	....	284	304	403	216
Cin., Ind., St. L. & Chic.	456	514	553	680	590	698
Clev., Ak. & Col.....	156	174	187	197	207	274
Denver & R. G	249	364	256	737	647	465
Det., Lansing & N.....	....	....	406	444	499	522
E. Tenn., Va. & Ga.....	243	255	254	252	247	263
Flint & Pere M.....	....	....	283	378	432	427
Hannibal & St. Jo.....	438	457	342	768	694	631
Ill. Cen., in Ill.....	541	558	548	640	597	674
Ill. Cen., in Iowa.....	231	279	262	339	426	333
Ind., Bloom. & West....	258	395	418	488	359	296
Int. & Gt. North.....	174	179	187	211	315	253
Lake Erie & West.....	....	...	...	327	322	274
Louisville & Nash.....	414	380	431	454	444	513
Mo., Kan. & Tex.....	322	280	329	417	538	392
Mobile & Ohio..... ...	184	190	218	258	268	258
Nash., Chat. & St. L	378	323	382	334	322	345
N. Y. & New Eng.....	....	....	688	746	781	780
Norfolk & West...	312	298	323	340	405	447
Northern Cen	774	842	995	1,382	1,352	1,564
Northern Pacific..... ..	....	....	299	334	521	523
Pennsylvania.....	1,096	1,478	1,622	1,843	2,000	2,139
Peoria, Dec. & Ev.....	...	....	.	225	209	290
Phila. & Reading.....	1,147	1,068	1,408	1,516	1,847	2,039
St. L., A. & T. H.—						
Main Line	....	384	494	708	609	625
Belleville Line.	453	477	532	745	384	580
St. Louis & Cairo.....	110	128	154	234	223	234
St. L. & San Fran.....	297	266	347	361	426	483
St. L., Iron Mt. & So...	405	437	482	632	779	687
St. P., Minn. & Man.....	....	...	431	415	456	837
Scioto Valley.....	....	282	241	340	305	354
South Carolina.....	192	195	192	253	263	282
Texas Pacific.....	402	319	367	429	358	348
Union Pacific..	....	....	....	633	732	615
Wabash, St. L. & P.....	....	....	.. .	552	456	423

Of the roads reporting, the following had larger July earnings in the previous years mentioned than this year:

20 out of 45 reporting in		1881
15	" 44 "	1880
5	" 40 "	1879
3	" 34 "	1878
4	" 31 "	1877

The result cannot be considered other than favorable, in view of the vast additions to mileage within the past three years (as much as 25,000 miles, or 30 per cent. in the whole United States), and the poor crops last year, which caused the June and July movement of grain, hogs, provisions and cotton to be unusually light this year. Expenses, however, have increased materially, and doubtless the showing of net earnings would not be nearly so favorable as that in gross, especially when compared with 1880 or 1879.

For the seven months ending with July our table has reports from 62 railroads whose aggregate length was 49,470 miles this year and 5,593 miles (12.7 per cent.) more than last year. With this mileage they earned $198,633,720, which is $21,924,993 (12.4 per cent.) more than last year, and their average earnings per mile decreased from $4,027 to $4,015—an insignificant change. Of the 62 roads, only 10 had a decrease in total earnings, but 23 had a decrease in earnings per mile, and these included many of the roads with very large mileage, the aggregate length of the lines showing a decrease being 21,805 miles.

There are 16 roads which report an increase of 15 per cent. or more in earnings per mile, but only nine show a decrease of as much as 10 per cent. The largest increases in earnings per mile and the earnings per mile this year of the roads that made them are:

	P. c. of inc.	Earn. per mile.
Ohio Central.....	63.8	$2,334
Marquette, Houghton & Ontonagon.....	58.6	7,713
Manitoba.....	56.5	4,843
Houston, E. & W. Texas.....	51.8	1,381
Mil., Lake Shore & W.....	44.7	1,756
St. Paul & Duluth.....	40.9	2,956
Wisconsin Central.....	36.2	1,937
Northern Pacific.....	29.7	2,985
Buff., Pitts. & Western.....	28.9	2,218
Hocking Valley...	21.0	4,655

There were no other increases which were as much as 20 per cent.

In examining this statement it is well to bear in mind that the average earnings per mile of the 62 roads reporting were $4,015. Only three of the roads with very large increases equal this average. These are the Marquette, Houghton & Ontonagon, an old and short road with an enormous traffic in iron ore; the St. Paul, Minneapolis & Manitoba, which has had the carrying of the whole of the vast immigration to Manitoba and the supplies therefor, besides an immense influx into the country directly on its own lines in Minnesota and Dakota; and the Hocking Valley road, a leading coal carrier in Ohio.

The roads with a decrease of 15 per cent. or more, and their earnings per mile, are:

	P. c. of decrease.	Earn. per mile.
Central Branch	36.0	$1,158
Denver & Rio Grande	26 3	3,431
Mobile & Ohio.....	21.6	1,940
Missouri, Kansas & Texas.....	17.5	2,580
St. Louis, Alton & T. H., Main Line.....	15.9	3,603

All of these have earnings below the average, but they are greater than those of most of the roads with large increases. The Denver & Rio Grande, which is mostly new road in a very thinly-peopled country, notwithstanding the large decrease, still had earnings per mile 36 per cent. greater than those of the Milwaukee & St. Paul, 30 per cent. more than those of the Wabash, and not a sixth less than those of the Union Pacific. Its decrease, however, has been larger in late months than earlier in the year.

LOCOMOTIVE BOILER CONSTRUCTION.

Probably few locomotive superintendents of the present day realize how much the working steam pressure in locomotive boilers has been increased since the early days of railroads. In Pambour's Treatise on Locomotive Engines, published in 1836, the author gives "a practical table of the diameter of the cylinder, and pressure of steam corresponding to given maximum loads." In this table the diameters of cylinders are given for pressures of 50, 55, 60, 65 and 70 lbs., indicating that, in the opinion of the author, it never

would be necessary to apply the table to any pressures above that indicated by the latter figures. In a report published in the same book, of some experiments made on the Liverpool & Manchester Railway, the maximum steam pressure in the boiler is given at 65.5 lbs. Most railroad men who have reached middle life can remember when the maximum pressure employed was 100 lbs. Then it was increased to 110 and 120, and within the past few years 130 and 140 have been the ordinary pressures to which the safety valves of locomotives are set. Quite recently another advance has been made in the Boston & Albany Railroad, where 165 to 175 is now the limit on the new engines on that line, and quite a number of master mechanics are contemplating following the example of Mr. Underhill, the Superintendent of Motive Power of that road.

Before employing such high pressures, though, it would be well to give some careful thought to the construction and proportions of the boilers which must resist that degree of tension, because it is self-evident that a boiler which has no more strength than is necessary to carry 120 lbs. pressure will have too little if the pressure is increased to 175 lbs.

D. K. Clark's "Recent Practice" contains a table giving the working pressure for different kinds of seams in boilers of various diameters and thickness of iron plates "whose ultimate tensile strength is 67,200 lbs. per square inch." The following figures were taken from that table:

Inside diameter of boiler.	Thickness of plates.	*Working pressure for different kinds of longitudinal seam.**		
		Double-riveted double-welt seam.	Double-riveted lap seam.	Single-riveted lap seam.
Inches.	Inches.	Lbs. per sq. in.	Lbs. per sq. in.	Lbs. per sq. in.
42.....	1/4	107	95	80
	5/16	134	119	100
	3/8	161	143	120
	7/16	189	....	....
	1/2	214	....	....
45.....	1/4	100	89	75
	5/16	125	111	94
	3/8	150	133	112
	7/16	175	....	....
	1/2	200	....	....
48.....	1/4	94	83	70
	5/16	117	104	88
	3/8	141	125	105
	7/16	164	....	....
	1/2	188	....	....
51.....	1/4	88	78	66
	5/16	110	98	82
	3/8	132	117	98
	7/16	154	....	....
	1/2	176	....	....
54.....	1/4	83	74	62
	5/16	104	92	77
	3/8	125	111	92
	7/16	146	....	....
	1/2	167	....	....
57.....	1/4	79	70	59
	5/16	99	88	74
	3/8	119	106	89
	7/16	139	....	....
	1/2	158	....	....

* The blanks respecting the 7/16 in. and 1/2 in. plates denote that the pressures are uncertain, but may be assumed at least equal to those for 3/8-in. plates.
The bursting pressure is five times the working pressure.

In the treatise from which this table is taken the author called attention to the fact that relatively the seams of thin plates are more efficient than those of thick plates, that is, that the percentage of the strength of the seam made of thin plates to that of the solid plates is greater than it is in one made of thick plates. For this reason the author regards it as uncertain whether a single or double-riveted lap joint made of 7/16 or 1/2 in. plates is any stronger than one made of 5/8 plates.

Since the date of the experiments on which the table is based there have been many other investigations made of the strength of riveted seams, which would materially modify the deductions summed up in the table. It is doubtful whether any iron or even steel plates, suitable for boilers, can be obtained with a tensile strength of 67,000 lbs. per square inch, if tested in large plates or sections of plates, and, by proportioning lap seams properly, there can be no doubt that if made of 7/16 or 1/2 in. plates they will be stronger than if made of 5/8 plates. Nevertheless, the table will be suggestive, and indicates that, even if double-riveted and double-welt seams are used, for the high pressures and with the large boilers which have recently been adopted thicker plates than any ordinarily used in this country should be used. The table indicates that boilers of 48 and 51 in. diameter should be made of 1/2 in plates to carry 175 lbs. pressure, and still thicker plates should be used for larger boilers. It is true that the bursting pressure is five times the working pressure, and, therefore, that boilers with thinner plates than those which the table indicates to be required may carry steam of the maximum tension named without giving way; but it must be remembered that all boilers are constantly subject to deterioration, and, therefore, that not only must they have sufficient strength when new, but must have a liberal margin, so that more or less corrosion will not make them dangerously weak. Although there is still a good deal that is mysterious about the phenomena of corrosion, and it is still very imperfectly understood, yet, we know enough about it to enable us very materially to diminish its action on boilers by designing them with reference thereto. We know, for example, that whenever the water used is of a corrosive character it will attack the plates at those points where they are subjected to any undue strain. Thus the most dangerous form of corrosion occurs along the inside edges of the plates which form longitudinal lap seams *below the water line.* It is said by those who have used butt seams with double welts or covering plates, that corrosion does not occur at all, or not to nearly the same extent, when they are used as it does with lap seams, and it has also been observed in this country that the horizontal seams are much more subject to corrosion than those which are circumferential. The obvious deduction from these facts is, first, to use butt-joints for all horizontal seams, and, second, to place them all above the water line.

But some master mechanics will say that there are practical difficulties in the way of doing this. Thus, if the dome is placed over the fire-box, the outside shell of the latter must either all be made in one plate, which cannot always be done conveniently, or there must be two horizontal seams, one on each side of the dome, which will necessarily come so low down as to be below the water line. A similar condition of things will be encountered if the dome is placed on the barrel of the boiler, excepting that there will then be only one seam instead of two. This difficulty may be overcome, however, by putting the horizontal seam of the plate to which the dome is attached on top of the boiler, and directly under the centre of the dome, and then strengthening the opening cut for the dome by a reinforcing ring, made in such a shape as to form a covering-plate for the seam on top of the boiler, where the edges of the two plates are butted together. Another welt or covering-plate is put on the inside of this butt joint, which in this way may be made just as strong as may be desired. By means of the reinforcing ring, which can be made of a plate of any thickness, the shell of the boiler at the base of the dome, which ordinarily is a very weak point, may be strengthened to any desired extent. The other longitudinal seams may then be placed alternately a little on one side of the centre on top and in the centre. In this way all the horizontal seams, excepting the two short ones on the upper edge of the throat sheets, in front of the fire-box and those at the mud ring, may be above the water line. The tendency to corrosion will thus be reduced to a minimum, and the shell of the boiler may be of maximum strength.

Locomotive builders and master mechanics, in this country, never seem to have realized fully the extent to which a boiler is weakened at the base of the dome by the opening which is cut for the latter. Probably not one per cent. of the engines in use are reinforced at this point in any other way than by flanging up the plate to which the dome is attached, which is quite inadequate to compensate for the material cut out of the plate. Large numbers of boilers have not even the flange to strengthen them. If the high pressures referred to in the early part of this article are used hereafter, it is of the utmost importance that boilers should be made stronger at this point. This was done long ago in Europe, and there it would be regarded as indicating inexcusable ignorance to make a boiler without a reinforcing ring of some kind at the base of the dome.

But after the shell has been made of the requisite strength, there remains the crown-plate, which is the most difficult part of a locomotive boiler to strengthen. It must be kept in mind, too, that increasing the thickness of the plates adds very little, if anything, to the strength of the top of the fire-box, which is flat. To support this it must be tied to the outside shell so that the upward pressure on the latter will counteract the downward pressure on the crown-plate. Its strength, therefore, *will depend upon the strength of the ties which hold it to the shell,* and on the way in which the strain is transmitted or exerted on the latter, which is usually a circular arch. Now if such an arch is loaded at or near the crown, and it is tied together at the bottom, the haunches, or the spaces between the crown and the two feet, being unloaded, they will be sprung outward by the strain. To be in a state of stability the strain, exerted towards the centre of the arch, must be equally distributed over the surface of the intrados or inner surface. It is hardly necessary to say that it is seldom that the pressure exerted on top of the crown-plate is transmitted to the shell so that the strains acting radially are uniformly distributed in the latter. In fact it generally is very unequally distributed, sometimes dangerously so. But it would lead to far to discuss this subject fully now and therefore it must deferred to the future, the aim of this article being chiefly to call attention to the necessity of giving more attention to the strength and to the construction of boilers if the working steam pressure is increased.

Differential Fares.

The differential passenger fares which were finally agreed upon at the meeting of the Joint Executive Committee last week differed somewhat from the figures which were published last week and from those submitted at the July meeting, and they also cover more ground—that is, they apply both to east-bound and west-bound business, and are made to and from all four of the Atlantic cities, together with Albany and Washington, and for second-class and "theatrical" tickets as well as first-class. It is not generally known how large a second-class traffic the trunk lines have. No special provision is made for it; that is, there are no cars exclusively devoted to second-class passengers, and probably the larger part of the community does not know that second-class tickets are sold. The holders of these tickets are put in any cars where the conductors can find room for them, the men frequently in the smoking car, and they cannot get a berth in a sleeping car, nor are they usually carried in through cars; but they mostly ride in cars with first-class passengers. Some trunk-line passenger agents estimate that 25 to 30 per cent. of the east-bound passengers ride on second-class tickets. West-bound the emigrant tickets take their place largely.

Though heretofore there have been no agreed differences in through passenger fares which were discussed at this meeting, actually differences have been made and were known to be made. How general this was may be judged by the fact that there has been so much difficulty in settling upon agreed differences. It was evidently considered a vital point by the lines which have had to make special exertions to get a share of the traffic. But part of the difficulty was due to the fact that the results heretofore obtained have not been the effect of a regular system of differences; but concessions have been made in each case as seemed necessary and advisable, and especially a very large share of the business has been done through outside agents, who were paid a fixed commission on each ticket sold, and who allowed the passenger a large part, a small part, or none at all, of his commission, according as he could make a bargain. Thus no one can do much more than guess what can be the effect of a fixed difference in rates and the total abolition of commissions. All the work done so far is merely tentative. If it does not produce results that are generally satisfactory, it will have to be modified.

In fact, as there has been as yet no apportionment of the passenger earnings among the several roads, no one can say what effect it is desired to produce by the differences in rates. For it must not be forgotten that the basis of the passenger agreement is the division of the aggregate passenger earnings of the coöperating roads among them in fixed proportions. When this is done, it will not make any difference in the passenger earnings of a road whether it gets "its share" of the travel or not; it will get its share of the pay just the same. But it is also a part of the agreement that effort shall be made to have each road earn as nearly as possible the share of the earnings which shall be apportioned to it. Now to fix the differences which will serve to distribute through travel and earnings before it is known what share each route is to get, seems a little like putting the cart before the horse. It is by no means certain, however, that *all* the roads over which differential fares are made will pool their passenger earnings.

The Joint Executive Committee spent five days last week in discussing these "differentials," and finally, having fully ventilated the subject, left it for Mr. Fink to decide among the conflicting claims. The chief differences from the rates agreed upon at the July meeting are: making the lower rate between Chicago and New York $18.50 first-class, instead of $18, the second-class rate remaining $16. This is a reduction of $1.50 from the full standard rate for the first-class and $1 for the second-class. No change was made in the Cincinnati-New York rates, but a reduction of $1

in first-class and 50 cents in second-class fares between Cincinnati and Boston and Albany was made. The St. Louis-New York rates were much changed, but only by small amounts. The Vandalia-Pennsylvania route remains the only one by which the full fares ($24.25 first-class and $20.25 second-class) are charged; the Wabash, which by all its connections was to charge $22.25 first-class by the July schedule, is made to charge $22 by way of the Erie and $23.25 by the New York Central. The Indianapolis & St. Louis, instead of $22.25 by all connections, makes the same differences as the Wabash; the Ohio & Mississippi, instead of $21.25 by the New York, Pennsylvania & Ohio and $22.25 by the Baltimore & Ohio, charges $20.75 by the former and $22 by the latter, and by the Chicago & Alton—Lake Erie & Western route, the rate is $20.75 instead of $21.25. Rates are also made to Philadelphia, Baltimore and Washington from St. Louis.

In the new schedule the greatest differences are $1.50 in the Chicago and $3.50 in the St. Louis first-class fares. There are two Chicago rates, three Cincinnati rates, and four St. Louis rates.

There was considerable opposition to making any differences in second-class fares, it being contended that there were substantially no differences in the accommodations (such as through cars) offered. Differences were made, however, but they are generally only one-half of the differences in the first-class fares. Theatrical fares had not been considered before. These are made for the traveling dramatic companies which have become so numerous of late years. They go in large parties, and long notice is given of the time of their journey, which makes them desirable; but they carry an enormous amount of baggage.

By agreement of the passenger agents heretofore, there was to be a reduction of 20 per cent. from the regular first-class fares to these parties and an extra allowance of baggage. There were no agreed differentials, but the whole business was largely done by special contracts. In the new schedule, the theatrical rates are made by subtracting 20 per cent. from a rate half way between the "differential" and the full standard rate. For instance, the full rate between Cincinnati and New York being $18, and the reduced rate by the New York, Pennsylvania & Ohio and the Erie being $16, the theatrical rate for the route with the lower rate is made by taking from $17 (the mean of the two rates) 20 per cent., or $3.40, leaving $13.60. This makes the differences somewhat less than those in second-class rates.

The differential fares are to be limited strictly to the routes and between the places named in the schedule; full rates will be charged to intermediate points. The differentials were to go into effect Sept. 1, and then the payment of commissions on tickets between the places named in the schedule was to cease. The reduced rate tickets are to be named and offered to passengers by the lines selling them; but these lines are not to be advertised by themselves as the cheapest routes, nor by their rivals as "inferior routes."

It seems to us questionable whether differences in rates so agreed upon will or ought to be permanent. The longer lines, by which the service is most costly, accept a lower price for carriage which could be done more satisfactorily to the passenger and at less cost by another road. It is inevitable that they should continue to do so as long as there is competition between the roads. The long line by which it costs $12 to carry a passenger will accept $16, though a short line by which the cost is $9 gets $18. If the two roads were consolidated, this would not long be continued. The company would prefer to carry all its passengers by the route which cost it least, and would not offer a premium for the sake of inducing them to ride over another line, which causes the company an additional expenditure of $3. It should be one of the objects of railroad co-operation to reduce the cost of performing the total service of the co-operating roads, not alone to increase the gross income received for doing it. Were the co-operation complete and its permanence guaranteed, efforts would be made in this direction inevitably. But we must creep before we can walk. With no legal sanction for its combinations with other lines, no road dares to give up any important branch of its traffic, even though given a much larger amount than its profits from it. It must be prepared at almost any moment to resume business entirely on its own account, and to compete sharply with those who are now its associates in co-operation. The time may come when it will be wise to have more confidence, and to extend the co-operation, but it will probably never come unless the public is made to feel very decidedly that it shares in the advantages of railroad co-operation. It should feel this by the differential rates, which offer to all who travel advantages which heretofore have been secured only by a knowing few, and by the small army of ticket-brokers, who have absorbed most of the differences now offered to the public.

Pennsylvania Railroad Earnings and Expenses in July.

The gross earnings of all the lines east of Pittsburgh of the Pennsylvania Railroad Company for the month of July last were $368,732 (7¾ per cent.) more than last year, the working expenses were $212,610 (9¼ per cent.) more, and the net earnings increased $156,122 (10½ per cent.). This large increase in profits was made in spite of a very great decrease in through freight to the East, but with the help of higher rates on this freight. For ten successive years the gross and net earnings and expenses of these lines have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1873	$3,203,462	$2,251,913	$951,549
1874	3,181,785	1,961,160	1,220,625
1875	3,073,103	1,913,126	1,159,977
1876	2,921,284	1,857,589	1,063,695
1877	1,880,337	1,400,976	479,361
1878	2,536,733	1,485,670	1,051,063
1879	2,782,606	1,783,291	999,615
1880	3,449,644	2,147,139	1,302,505
1881	3,780,418	2,289,447	1,490,971
1882	4,149,150	2,502,057	1,647,093

The earnings of this month this year were not only larger than in any previous July, and $700,000 (20 per cent.) more than in the very prosperous year 1880, but they were larger than in any previous month in the history of the road. For three months in succession now, the earnings have been more than $4,000,000, which never occurred before, except in October, 1876, and September, 1873.

The working expenses also were larger than in any previous July, but were exceeded slightly in December, April and June last, and in no other months. The net earnings were larger than in any other July, 26½ per cent. more than in 1880, and 64½ per cent. more than in 1879, but they were exceeded last May, in each of the spring months last year, also in October, 1879, and very largely in September, October and November, 1876, and also in September of 1873.

For the seven months ending with July the gross earnings this year were $1,465,741 (5¾ per cent.) more than last, and the expenses $2,116,651 (14¼ per cent.) more, causing a *decrease* of $650,910 (6¼ per cent.) in net earnings. The great gain in gross earnings made in this period, when through rates were on the average extraordinarily low and east-bound through freight also unusually light, is remarkable, but not more so than the great increase in expenses. These were 63.3 per cent. of the earnings this year, against 58.6 per cent. last year, indicating much lower average rates, or a great increase in the elements of expenses, which, as there has been no great advance in wages or materials, is not probable.

For the seven months ending with July the gross and net earnings and working expenses have been, for six successive years:

Year.	Gross earnings.	Expenses.	Net earnings.
1877	$16,216,733	$11,007,953	$5,208,780
1878	16,988,571	10,591,710	6,396,961
1879	18,196,094	11,351,494	6,845,470
1880	22,883,715	13,486,801	9,396,914
1881	25,334,257	14,846,132	10,488,125
1882	26,800,003	16,962,991	9,837,012

Gross earnings and working expenses have thus been larger this year than ever before; but net earnings are less than last year. Compared with 1880, the increase in net earnings has been but $440,000, while there has been an increase of $3,917,000 in the gross earnings, so great has been the increase in expenses.

The net earnings of the system of leased lines west of Pittsburgh and Erie were $212,640 in excess of rentals and interest for the seven months this year, against $1,755,871 in 1881 and $1,611,963 in 1880—a decrease in profits amounting to $1,543,182 this year, which, added to the decrease in net earnings, makes the profits of the Pennsylvania Railroad Company $2,194,091 less than in 1881, and $968,772 less than in 1880. The decrease from 1881 is equivalent to about 2½ per cent. on the present enlarged stock capital. During July the profits of the Western lines were $102,640 greater than last year, and the net earnings of the Eastern lines $156,122—together $258,762. This is the first month in which the comparison is with the period of railroad war last year. July last year, however, the war extended only to east-bound freight, and in a slight degree only to passenger traffic. During the remaining five months last year and the year before, the results of the operations were:

	1881.	1880.	Decrease.
Net earnings east of Pittsburgh	$6,926,948	$7,238,311	$312,063
Profits west of Pittsburg	957,281	1,460,089	502,808
Total	$7,583,529	$8,698,400	$814,871

Thus last year there was an average decrease in profits during these five months of railroad war of about $163,000 a month. This year, with the heavy wheat crop and generally improved crops and the higher rates, there is a certainty of greatly increased gross earnings, and a probability of a large increase in net earnings. To overcome the decrease in the first half of the year, however, there will have to be an average increase of about $440,000 a month in the profits of these two systems. As the Western lines suffered greatly last year from the poor wheat crop, a large increase on them is reasonably to be expected, while all the lines will profit from the better rates on all through freights and passengers. The revival of activity at the Pittsburgh and Cleveland iron works, which cannot be much longer delayed, will also considerably improve the business of this company's lines. It seems reasonable to expect, then, that the entire year will show as large profits as last year.

That the new wheat crop, or something else, had considerable effect on the earnings of the Western lines may be judged from the fact that in July these lines showed a *profit* of $333,347, whereas for the six months previous they had shown an average *loss* of $20,110 per month. Henceforward we may expect to see a considerable improvement in profits over last every month.

Since 1878 the profits of the Western system have varied greatly in different months, but until last year they were much greater in the last half than in the first half of the year. In 1879 there were losses in five months of the year, and at the end of June there was a loss of $419,337, but for the second half of the year a profit of $2,042,977. In 1880 there was a profit in every month of the year, varying from $8,481 in June to $557,171 in March, in which latter month the profits from through east-bound freight were the largest ever known. In 1881 there was a loss only in June and December, but then the profits were much larger in the first five months than in the fall months, rising to $524,489 in March.

Foreign Railroad Notes.

Egypt furnishes the last bit of railroad humor. Prof. Masperro had discovered the mummy of King Merenra. The Arabs had plundered his tomb, taken him out of his sarcophagus, and even robbed him of the numerous folds of cloth in which mummies are wrapped, and the body lay on the ground like a stick of dry wood. To get it to the museum at Boulak was the task of the Professor, and for this purpose it was put across the back of a donkey and so carried to the nearest railroad station at Bedreschin. The person in charge wished to take him as baggage. But on the Egyptian railroads there is not only a charge for baggage, but the charge is not according to weight but according to class. How to classify the dead king bothered the station agent. After rummaging all his tariffs, new and old, and finding "mummies" in none of the classes, he finally threw down his books and said: "What is the thing good for, anyhow? What is it made of?" When the museum people told him it was a man, he said: "Very well; if it is a man, he must pay for his ticket;" and, in fact, they were compelled to buy a ticket for His Sainted Majesty King Merenra, and, it is said that, out of respect to his rank they bought a first-class ticket for him. But this was not the end of it. At Cairo the mummy was put into a carriage and started for the museum. Arriving at a bridge toll was demanded, and the gate-keeper asked what was in the carriage. What a mummy was he did not know and tolls were according to the object passing, and he must know what class the mummy belonged to before he could pass it. Fortunately it occurred to someone attached to the museum that often a fish had been sent from Upper Egypt, and that one of these sun-dried fish had about the color of the mummy, and was not very unlike in appearance. So he says to the bridge-keeper: "Don't you see that it is a dried fish?" Thereupon the bridge-keeper took his book, looked up the rate for dried fish, weighed His Majesty, and calculated the charge according to the weight. And so King Merenra, who seven thousand years ago may have entered Cairo in triumph, returned to the capital as a dried fish.

At the close of the year 1880 there were 15,467 locomotives on the roads of the German Railroad Union, which was at the rate of one to 2.3 miles of road. During the year only 182 were added to the stock. There were 29,357 passenger cars, or 0.834 cars with seats for 35.4 passengers for every mile of road—the average capacity of a car being for 18¼ passengers. There were seats for 333 more at the end than at the beginning of the year. At the same time there were 328,858 freight cars on these roads, of which 123,541 were covered cars—a much larger proportion than in England. Altogether these cars had 669,375 axles—that is, an overwhelming majority of them had but two axles. The addition to the stock during the year was 6,073. Their aggregate capacity was almost exactly 3,500,000 tons, or 21,290 lbs. each. There were 9.34 such cars with 99⅛ tons capacity for each mile of road.

The locomotives ran 261,913,854 miles during the year; 186,137,835 miles with trains, 67,623,586 miles in switching, and 8,152,633 miles running empty. The average train mileage per locomotive was 12,182, and the mileage per mile of road was 5,319, which is at the average rate of 7.3 trains each way daily over the whole system. The average mileage of passenger cars was 19,410; of freight cars, 9,323. On the average, 24 per cent. of the seats of the passenger cars, and 43.6 per cent. of the capacity of the freight cars was occupied. The number of passenger miles was 5,735,593,000, which was 4.6 per cent. more than in 1879, when the passenger mileage was 2.1 per cent. *less* than in 1878. There were 167,282 passenger miles per average mile of road, which is at the rate of 229 passengers—say four American cars full—each way daily over the whole mileage of road. In this there was an increase of 2.4 per cent. over 1879, while for four years previous there had been a decrease every year. Of the passenger miles 53 per cent. was by third-class, 19.3 by second-class, 18.5 by fourth-class and 3 per cent. by first-class passengers; while 6.2 per cent. was by passengers traveling at less than the regular rates for their class (children, soldiers, etc.)

The number of ton-miles was 12,204,920,000, which was 6.2 per cent. more in 1879. Ninety per cent. of all the freight was shipped in car-loads, which is caused by the very much higher rates charged for small quantities. Less than 2 per cent. of the freight was live stock. The tonnage per mile of road was 344,689—equivalent to 472 tons each way daily over the whole mileage.

The superstructure of the Berlin elevated railroad is laid with iron longitudinal sleepers of the Hartmann system, which weighs, without the tie rods, 264 lbs. per yard of track, and is throughout bedded in ballast laid on the masonry viaduct. The road is worked with tank locomotives weighing when in service 89, 200 lbs, 61,600 lbs being on the driving-wheels, and designed to work under a pressure 154 lbs. of steam. They have cylinders 14.4x23.2 in. driving-wheels 5 ft. 3 in. and two trailing-wheels 41½ in. in diameter. The total wheel-base is 13 ft. 1½ in., the driving-wheel base being 7 ft. 4 in. The heating surface is about 712 square feet. The locomotives all have the Allan valve and are provided with vacuum brakes. On Sundays and holidays the interval between trains is sometimes no more than five minutes. Safety is provided for by the Siemens & Halske block system—an absolute block.

Austria has established a "Railroad Council," something like those established in Germany which we described some months ago. Part of its members are chosen by chambers of commerce, etc., and part appointed by the Minister of Commerce, and they will advise as to changes in railroad rates, accommodations to shippers, etc.

A Curious Accident.

The *London Engineer* of Aug. 4 contains an account of a very singular accident which happened to the Great Eastern Railway the week before the above date. It says:

"After the 4:40 p. m. up express train from Norwich had passed Ely a short distance, and was traversing the Fen district, the balance-weight of the link motion of the engine drawing the train fell off, dropping between the rails, and escaping from beneath the train, jumped across the six-foot into the down track. In getting from beneath the down train it struck and damaged an axle-box of the second coach from the engine. At the moment that it entered the down road the 5:15 train from London was passing, and the balance-weight came in contact with the engine drawing the train, which shortly afterwards left the rails, taking seven vehicles with it. * * * A most remarkable feature of the accident is the escape of the weight through the wheels of its own train, which followed each other over any given spot on the rails in very quick succession, the engine running at a high speed at the time."

The paper quoted from gives an engraving of this "balance-weight" or counterbalance, as we would call it here. It is a cylindrical casting two feet long and weighed 636 pounds. This was attached to two arms, on the opposite side of the lifting-shaft from the arms to which the links are suspended, the portion of each which carried the link and that which carried the weight being forged in one piece, with a hole near its centre, in which the shaft was keyed. The arms passed transversely through openings in the cylindrical casting, which was fastened to them by a bolt through its axis, which also passed through the wrought-iron arms.

It is hardly necessary to say to those of our readers who are practically acquainted with locomotives, that this method of counterbalancing the weight of the links was abandoned here twenty years ago, and that springs have been used for the same purpose which do not weigh one tenth as much as the weight described. It has been a matter of great surprise to American locomotive builders that their English brethern have adhered so long to what seems like an awkward and antiquated method of doing what can be done with means so much less cumbrous. Perhaps this accident may incline them to use methods employed here.

The accident though, was a remarkable one, and *The Engineer* in commenting on it says:

"There has not yet been an accident which more conclusively proves the value of the automatic brake. The four trailing vehicles of the train stood on the rails entirely uninjured. Just in front of them was a London, Brighton & South Coast saloon, with its leading wheels off the rails, but unharmed, save that it had a broken headstock and buffer. One of the coaches next the engine stood on its trailing wheels and leading end, the leading wheels being gone, but the next coaches were all upset; but the noteworthy fact is that not one of these vehicles telescoped with another or attempted to climb on it. Although the whole distance run was but 114 yards after the balance-weight struck the engine, and although the speed was over forty-five miles an hour, there was no piling up of carriages, and in this respect this accident stands almost unique. If any other than a powerful automatic brake had been used, the whole train would have been, beyond any question, piled up more or less on top of the engine, and the loss of life would have been dreadful. As it is, no one has been killed, and the damage done to property is comparatively small."

"Safety Attachments to Locomotive Boilers."—Correction.

We regret that in publishing the engravings of a steam-gauge stand and check-valve case accompanying Mr. Berkeley Powell's paper, with the above title, we fell into an error and credited their design to Mr. Jacob Johann. Our mistake was due to the fact that in his paper Mr. Powell said: "To Mr. Jacob Johann first belongs the honor of making public a steam-gauge stand provided with a safety-valve opening into the boiler which closes when an accident breaks off the stand. I have taken the liberty of incorporating this invention in the drawings of a steam-gauge stand accompanying this paper." From this we hastily inferred that the whole design was by Mr. Johann, whereas the safety-valve was the only feature which should have been credited to him. With this exception the steam-gauge stand and safety-valve case were designed by Mr. Powell, whose address is Concord, N. H.

We will add that there are no accidents which are attended with such terrible suffering and agony as those in which persons are scalded by escaping steam or hot water from the locomotive, and that railroad companies which do not use the most approved appliances for preventing such accidents are to a very great extent responsible for the suffering which is a consequence of not using such devices as Mr. Powell has designed.

RAILROAD EARNINGS IN JULY.

NAME OF ROAD.	MILEAGE. 1882.	1881.	Inc.	Dec	P.c.	EARNINGS. 1882.	1881.	Increase.	Decrease.	P. c.	EARNINGS PER MILE. 1882.	1881.	Inc.	Dec.	P. c.
						$	$	$	$		$	$	$	$	
Ala. Gt. Southern	290	290				61,041	57,982	3,059		5.3	210	199	11		5.3
Atchison, Top. & S. F.	1,832	1,670	162		9.7	1,087,000	1,006,633	80,367		8.0	594	602		8	1.3
Buffalo, Pitts. & West	223	205	18		8.8	82,723	50,737	25,986		45.8	371	277	94		33.5
Bur., Ced. Rap. & No.	620	564	56		9.9	198,275	174,351	23,924		13.8	320	300	11		3.5
Central Iowa	244	190	54		28.4	91,587	88,713	2,874		3.2	375	467		92	19.0
Central Pacific	2,995	2,635	360		13.8	2,020,000	1,899,346	120,654		6.4	674	721		47	6.6
Ches. & Ohio	517	435	82		18.9	306,831	225,096	81,735		36.3	593	517	76		14.9
Chicago & Alton	847	840	7		0.8	671,537	676,205		4,668	0.7	793	807		14	1.6
Chi. & Eastern Ill	232	220	12		5.5	150,739	125,139	25,600		20.5	649	568	81		14.2
Chi. & Gd. Trk*	345	335				135,882	99,241	36,641		37.0	405	296	109		37.0
Chi., Mil. & St. Paul	4,350	3,800	550		14.5	1,465,000	1,568,706		103,706	6.6	337	413		76	18.5
Chi. & Northwestern	3,310	2,803	510		18.2	2,025,736	1,983,031	42,705		2.1	612	708		96	13.5
Chi., St. P., M. & O	1,050	950	100		10.5	331,480	383,202		51,722	13.5	316	403		87	21.6
Cin., Ind., St. L. & Chi.	300	300				209,564	177,161	32,403		18.3	698	590	108		18.3
Cin., N. O. & T. Pac	336	336				222,211	189,819	32,392		17.0	661	565	96		17.0
Cleve., Akron & Col	144	144				39,456	29,805	9,651		32.2	274	207	67		32.2
Col., Hock'g V. & Tol	320	320				224,019	192,528	31,491		16.3	700	602	98		16.3
Denver & R. G	1,066	847	219		25.9	495,797	548,284		52,487	9.6	465	647		182	28.0
Det., Lan. & Nor.*	226	226				118,004	112,707	5,297		4.7	522	499	23		4.7
E. Tenn., Va. & Ga.*	900	900				236,339	222,760	13,579		6.1	263	247	16		6.1
Evansv. & T. H.*	157	144	13		9.0	120,779	60,559	60,220		98.7	759	421	338		84.0
Flint & Pere Mar	345	318	27		8.5	147,462	137,640	9,822		7.1	427	432		5	1.2
G'n B., Win. & St. P.*	220	220				26,791	32,472		5,681	17.5	122	148		26	17.5
Gulf, Col. & S. F	392	260	132		50.8	93,733	66,052	27,681		41.9	239	254		15	6.0
Hannibal & St. Jo	292	292				184,347	201,899		17,552	8.7	631	694		63	8.7
Houston, E. & W. Tex	104	88	16		18.2	21,348	12,521	8,827		70.6	205	142	63		44.5
Ill. Cen., Ill. lines	918	918				618,478	548,318	70,160		12.8	674	597	77		12.8
Iowa lines	402	402				133,773	171,686		37,913	22.0	333	426		93	22.0
Ind., Bloom. & West	695	555	140		25.2	206,072	199,125	6,947		3.5	296	359		63	17.5
K. C., Ft. S. & G	360	320	40		12.5	133,774	122,394	11,380		9.3	372	382		10	2.6
Lake Erie & Western	386	386				105,866	121,459		18,592	15.0	274	322		48	15.0
Little Rock & Ft. S.*	168	168				26,100	32,236		6,136	19.2	155	197		37	19.2
Long Island	335	328	7		2.1	279,231	243,880	35,351		14.4	834	744	90		12.1
Louisville & Nash	2,025	1,840	185		10.1	1,038,385	817,135	221,250		27.1	513	444	69		15.3
Louisv., N. A. & Chi.*	380	290	90		31.0	119,193	82,535	36,658		44.1	314	285	29		10.2
Mar., Hought. & Ont.	88	88				194,979	154,755	40,224		26.0	2,216	1,759	457		26.0
Mil., L. S. & West	280	250	30		12.0	68,993	49,631	19,362		38.7	246	199	47		23.6
Mo. Pacific lines:															
Central Branch	387	300	87		29.0	57,960	82,094		24,134	29.4	150	273		123	45.5
Int. & Gt. Northern	775	623	152		24.4	196,856	196,062	794		0.4	253	315		62	19.0
Mo., Kan. & Tex	1,230	900	330		36.7	482,334	484,576		2,242	0.5	392	538		146	27.0
Mo. Pacific	935	800	135		16.9	734,008	568,507	165,501		29.1	785	711	74		10.4
St. L., I. M. & So	750	685	65		9.5	515,519	533,512		17,993	3.4	687	779		92	11.8
Texas & Pacific	1,054	825	229		27.8	367,215	328,063	39,152		11.9	348	358		10	2.8
Mobile & Ohio	538	506	32		4.3	136,398	135,548	850		0.6	258	268		10	3.7
Nash., Chatta. & St. L.	467	467				160,990	150,430	10,560		6.7	345	322	21		6.7
N. Y. & N. England	396	316	80		25.3	308,920	246,820	62,100		25.1	780	781		1	0.1
Norfolk & Western	428	428				191,545	173,385	18,160		10.5	447	405	42		10.5
Northern Central	326	326				509,683	440,811	68 872		15.2	1,564	1,352	212		15.2
Northern Pacific	1,298	754	544		72.5	679,240	393,360	285,980		72.8	523	521	2		0.3
Ohio Central	232	232				85,572	55,226	30,346		55.1	369	238	131		55.1
Ohio Southern*	138	128	10		7.8	27,494	22,195	5,299		24.1	199	173	26		15.3
Pennsylvania†	1,940	1,890	50		2.6	4,149,150	3,780,418	368,732		8.6	2,139	2,000	139		6.9
Peo., Dec. & Evansv.	254	248	6		2.4	73,740	51,913	21,827		41.9	290	209	81		38.8
Phila. & Reading	994	994				2,026,459	1,835,715	190,734		10.4	2,039	1,847	192		10.4
St. L., A. & T. H., M. Li'e	195	195				121,847	118,844	3,003		2.5	625	609	16		2.5
Belleville Line	121	121				70,170	46,549	23,621		50.3	580	384	196		50.3
St. Louis & Cairo	146	146				34,140	32,636	1,504		4.5	234	223	11		4.5
St. Louis & San Fran.	660	592	68		11.5	318,013	252,333	66,280		26.2	483	426	57		13.2
St Paul & Duluth	175	175				96,954	71,412	25,542		36.0	555	408	147		36.0
St. P., Minn. & Man	1,020	850	170		20.0	853,296	387,488	465,808		120.2	837	456	381		83.5
Scioto Valley	128	128				45,352	39,073	6,279		16.1	354	305	49		16.1
South Carolina	243	243				68,462	63,984	4,478		7.0	282	263	19		7.0
Tol., Cin. & St. L	484	435	49		12.2	73,661	59,268	14,393		24.1	152	136	16		11.6
Union Pacific	3,740	3,450	290		8.4	2,301,000	2,526,000		225,000	8.9	615	732		117	16.0
Utah Central*	280	280				115,589	100,630	14,959		14.9	416	359	52		14 9
Vicks. & Meridian*	142	142				26,627	31,677		5,050	15.8	187	223		36	16.3
Wab., St. L. & Pacific	3,350	2,480	870		35.1	1,418,837	1,131,752	287.085		25.3	423	456		33	7.2
Wisconsin Central	520	520				79,358	77,805	1,553		2 0	153	150	3		2.0
Total, 68 roads	51,020	45,053	5,967			30,019,504	27,292,738	3,299.643	572,877		588	606		18	
Total inc. or dec			5,967		13.2			2,726,766		10.0				18	3 0

* Roads marked thus are not in the table of earnings for the seven months. † Includes all lines east of Pittsburgh and Erie.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Buffalo, Pittsburgh & Western.—Extended from Silver Creek, N. Y., northeast to Buffalo, 30 miles.

California Southern.—Extended northward to Colton, Cal., 21 miles.

Catskill Mountains.—Extended from Lawrenceville, N. Y. to Mountain House, 2 miles. Gauge, 3 ft.

Central Iowa.—Track is laid on this company's east and west line from Oskaloosa, Ia., east to Brighton, 48 miles.

Chicago, Burlington & Quincy.—The *Omaha Line* is extended from Calvert, Neb., west by north to Tecumseh, 20 miles.

Danville, Olney & Ohio River.—Extended from West Liberty, Ill., southward to Olney, 9 miles.

Des Moines, Osceola & Southern.—Extended northward to Des Moines, Ia., 32 miles. Gauge, 3 ft.

Field Creek.—Completed from a point on the Chesapeake & Ohio road thirteen miles east of Charleston, W. Va., up Field Creek, 6 miles.

Galveston, Harrisburg & San Antonio.—A branch is completed from Harwood, Tex., south to Gonzales, 14 miles.

Louisville & Nashville.—The *Knoxville Branch* is extended from London, Ky., south to Robinson Creek, 10 miles. Gauge, 5 ft.

New York, Chicago & St. Louis.—Completed by laying track from Derby, N. Y., to junction with New York, Lake Erie & Western, 16.60 miles; from Cleveland & Pittsburgh Crossing to Lake Shore Crossing in Cleveland, O., 7.24 miles, and near Grand Crossing, Ill., 1 mile, making 24.84 miles in all.

New York, Lackawanna & Western.—Track laid for 15 miles east of Mt. Morris, N. Y., and for 3½ miles in Buffalo.

Paint Creek.—Completed from a point twenty-one miles east of Charleston, W. Va., on the Chesapeake & Ohio road, up Paint Creek 5 miles. Gauge, 3 ft.

Pittsburgh & Western.—Extended from Wurtemburg, Pa., northwest to Chewton, 6 miles. Gauge, 3 ft.

San Luis Obispo & Santa Maria Valley.—Extended from San Luis Obispo, Cal., southward to Santa Maria, 31½ miles. Gauge, 3 ft.

Seaboard & Raleigh.—Extended west to Robersonville, N. C., 8 miles.

Tonawanda Valley & Cuba.—Extended from Arcade, N. Y., south to Cuba, 24 miles. Gauge, 3 ft.

Union Pacific.—On the *Denver & South Park Division* the *Breckenridge Branch* is extended from Boreas, Col., northwest to Breckenridge, 18 miles. The *Gunnison Branch* is extended west by south to Gunnison, Col., 30 miles. Gauge, 3 ft.

Wabash, St. Louis & Pacific.—The *Des Moines Division* is extended from Jefferson, Ia., northwest to Eads, 21 miles. Track is laid on the *Des Moines & St. Louis Division* from Albia, Ia., northwest to Des Moines, 69 miles.

Warren & Farnsworth Valley.—Completed from Clarendon, Pa., to Tionesta, 12 miles. Gauge, 3 ft.

This is a total of 560 miles of new railroad, making 6,544 miles thus far this year, against 3,719 miles reported at the corresponding time in 1881, 2,950 miles in 1880, 1,599 miles in 1879, 1,123 miles in 1878, 1,108 miles in 1877, 1,388 miles in 1876, 678 miles in 1875, 984 miles in 1874, 1,408 miles in 1873 and 4,264 miles in 1872.

CHICAGO RAIL SHIPMENTS EASTWARD for the week ending Aug. 26, including only the freight billed at Chicago and excluding that from points west billed through Chicago, were 28,949 tons, against 18,113 the week before and 53,473 tons in the corresponding week of last year. The shipments last week were thus 60 per cent. more than the week before, and they were also larger than in any previous week of this year since March 18. The great and sudden increase is said to have been chiefly due to large shipments of new oats, which are now coming forward to take the place of corn for feed; and as they are largely consumed at the interior points in the East, they are carried chiefly by rail. It is said, however, that the oats were largely sold for August delivery, and were not likely to arrive in time if shipped by canal, and this view is supported by the fact that of the large receipts at New York last week, none were by canal. The lack of corn, however, is likely to make the oats movement unusually heavy for two months to come or more, and oats have always moved chiefly by rail. For instance, in 1880 (a year of comparatively high rail rates and therefore favorable to the water route), out of 20,650,000 bushels of oats shipped from Chicago, only 2,140,000 went by lake, and out of 14,000,000 received at New York only 1,000,000 arrived by canal.

The statement of the complete east-bound shipments from

RAILROAD EARNINGS, SEVEN MONTHS ENDING JULY 31.

NAME OF ROAD	MILEAGE. 1882.	1881.	Inc.	Dec	P. c.	EARNINGS. 1882.	1881.	Increase.	Dec.	P. c.	EARNINGS PER MILE. 1882.	1881.	Inc.	Dec.	P. c.
						$	$	$	$		$	$	$	$	
Ala. Gt. Southern	290	290	.....	.....	.....	423,589	404,835	18,754	.....	4.6	1,461	1,396	65	....	4.6
Atchison, Top. & S. F.	1,805	1,633	172	....	10.5	7,887,718	6,402,839	1,484,879	.....	23.2	4,370	3,921	449	....	11.5
Buffalo, Pitts. & West.	210	205	5	....	2.4	465 879	353,803	112,076	.....	32.0	2,218	1,726	492	....	28.9
Bur., Cedar Rap. & No.	620	564	56	....	9.9	1,489,674	1,171,383	318,291	.....	27.2	2,403	2,077	326	....	15.5
Central Iowa	244	190	54	....	28.4	637,758	479,169	158,589	.....	33.1	2,614	2,522	92	....	3.7
Central Pacific	2,933	2,610	323	....	12.4	14,196,568	12,789,271	1,407,297	.....	11.0	4,840	4,900	...	60	1.2
Ches. & Ohio	474	435	39	....	9.0	1,705 950	1,521,219	184,731	.....	12.1	3,599	3,497	102	....	2.9
Chi. & Alton	847	840	7	....	0.8	4,102,287	3,922,163	180,124	.....	4.6	4,843	4,669	174	....	3.7
Chi. & Eastern Ill.	232	220	12	....	5.5	965,249	885,596	79,653	.....	9.0	4,154	4,025	129	....	3.2
Chi., Mil. & St. Paul	4,228	3,797	431	....	11.3	10,605,000	8,687,507	1,917,493	.....	22.1	2,508	2,288	220	....	9.6
Chi. & Northwestern	3,284	2,794	490	....	17.5	12,551,051	11,025,755	1,525,296	.....	13.8	3,822	3,946	....	124	3.1
Chi., St. P., Minn. & O.	1,037	950	87	....	9.2	2,560,498	2,067,129	493,369	.....	23.9	2,469	2,176	293	....	13.4
Cin., Ind., St. L. & Chi.	300	30	....	....	....	1,422,435	1,289,240	133,195	.....	10.3	4,741	4,297	444	....	10.3
Cin., N. O. & Tex. Pac	336	336	.....	.....	.....	1,379,555	1,194,406	185,149	.....	15.5	4,106	3,555	551	....	15.5
Cleve., Akron & Col	144	144	.....	.....	.....	274,917	233,122	41,795	.....	17.9	1,909	1,619	290	....	17.9
Cleve., Col., Cin. & Ind*	391	391	.....	.....	.....	2,243,904	2,492,525	.....	248,621	9.9	5,739	6,375	....	636	9.9
Col., Hock'g Vy. & Tol	320	320	.....	.....	.....	1,489,722	1,231,176	258,546	.....	21.0	4,655	3,847	808	....	21.0
Denver & Rio Grande	1,063	665	398	....	59.9	3,647,430	3,104,041	543 389	.....	17.5	3,431	4,668	....	1237	26.3
Des M. & Ft. Dodge*	84	84	...	...	.....	201.287	200.717	570	.....	0.3	2,396	2,389	7	....	0.3
Flint & Pere Marq.	345	318	27	....	8.5	1,199,105	1,041,188	157.917	.....	15.2	3,476	3,264	202	....	6.1
Grand Trunk*	1,460	1,408	52	....	3.7	6,159,934	6,151,970	7,964	.....	0.1	4,219	4,369	....	150	3.4
Great Western*	526	526	.....	.....	.....	2,816,441	2,972,483	.....	156,042	5.2	5,354	5,651	....	297	5.2
Gulf, Col. & S. F.	336	220	116	....	52.7	581,920	440,348	141,572	.....	32.2	1,732	2,002	....	270	13.5
Hannibal & St. Jo.	292	292	..	..	.....	1,088,625	1,210,032	.....	121,407	10.0	3,728	4,144	....	416	10.0
Houston, E. & W. Tex.	104	86	18	....	20.9	143,605	78,531	65,074	.....	83.0	1,381	914	467	....	51.8
Ill. Cent., Ill. lines	918	918	.....	.....	.....	3,821,800	3,613,693	208,115	.....	5.8	4,163	3,937	226	....	5.8
Iowa lines	402	402	.....	.....	.....	1,039,198	959,519	79,679	.....	8.3	2,585	2,386	199	....	8.3
Ind., Bloom. & West.	575	555	20	....	3.6	1,358,507	1,345,773	12,734	.....	0.9	2,362	2,425	....	62	2.5
Kan. City, Ft. Scott & G.	337	307	30	....	9.7	904,567	816,330	88,237	.....	10.8	2,684	2,659	25	....	0.9
Lake Erie & West	386	386	.....	.....	.....	763,646	750,048	13,598	.....	1.8	1,978	1,943	35	....	1.8
Long Island	335	321	14	....	4.1	1,201,091	1,055,232	145,859	.....	13.8	3 585	3,287	298	....	9.0
Louisville & Nashv.	2,025	1,840	185	....	10.1	7,123,049	6,294,650	828,399	.....	13.2	3,578	3,421	97	....	2.8
Mar., Hought. & Ont.	88	88	.....	.....	.....	678,771	427,976	250,795	.....	58.6	7,713	4,863	285	....	58.6
Mil., Lake Sh. & West.	280	250	30	....	12.0	491,538	304,565	186,973	.....	61.3	1,756	1,218	538	....	44.7
Mo. Pacific lines:															
Central Branch.	380	300	80	....	26.7	440.272	542,102	.....	101,830	18.8	1,158	1,807	....	649	36.0
Int. & Gt. No.	775	623	152	....	24.4	1,539,814	1,329,825	199.989	.....	14.9	1,787	2,151	....	164	7.5
Mo., Kan. & Tex.	1,213	889	324	....	36.0	3,129,661	2,779,759	349,902	.....	12.6	2,580	3,127	....	547	17.5
Mo. Pacific	877	743	134	....	18.3	3,949,587	3,601,743	347,844	.....	9.7	4,503	4,848	....	345	7.0
St. L., Iron Mt. & So.	735	685	50	....	7.2	5,868,941	.....	.....	122,119	3.2	5,098	5 618	....	559	9.7
Texas & Pacific	980	760	220	....	29.0	2,430,039	2,060,509	369,530	.....	17.9	2,480	2,711	....	231	8.5
Mobile & Ohio	528	506	22	....	4.3	1,024,125	1,253,447	.....	229,322	18.2	1,940	2,447	....	537	21.6
Nash., Chatta. & St. L.	467	467	.....	.....	.....	1,047,736	1,229,655	.....	181,919	14.8	2,243	2,633	....	390	14.8
N. Y. & New England	396	316	80	....	25.3	1,848,569	1,487,878	360,751	.....	24.2	4,668	4,708	....	40	0.8
Norfolk & Western	428	428	.....	.....	.....	1,216,494	1,168,504	47,990	.....	4.1	2,852	2,730	122	....	4.1
Northern Central	326	326	.....	.....	.....	3,161,354	3,102,679	58,675	.....	1.9	9,698	9,518	180	....	1.9
Northern Pacific	1,094	735	359	....	48.8	3,265.481	1,692,494	1,572,787	.....	92.9	2,985	2,303	682	....	29.7
Ohio Central	232	232	.....	.....	.....	541,558	330,017	211,541	.....	63.8	2,334	1,422	912	....	63.8
Pennsylvania†	1,929	1,890	39	....	2.1	26,799,9 9	25,334,258	1,465,741	.....	5.8	13,892	13,404	488	....	3.6
Peoria, Dec. & Evans.	254	224	30	....	13.4	440.903	336,185	104,718	.....	31.2	1,736	1,501	235	....	15.7
Phila. & Reading	994	994	.....	.....	.....	11,557,956	10,972,814	585,142	.....	5.3	11,628	11,039	589	....	5.3
St. L., Alt. & T. H.,															
Main Line	195	195	....	.....	.....	702,567	835,089	.....	132,522	15.9	3,603	4,283	...	680	15.9
Belleville Line	121	121	.....	.....	.....	456.751	414,930	41,821	.....	10.1	3,775	3,429	346	....	10.1
St. L. & Cairo	146	146	.....	.....	.....	204,158	239,934	.....	35,776	14.9	1,398	1 643	....	245	14.9
St. L. & San Francisco.	660	592	68	....	11.5	1,832,462	1,714,004	118,458	.....	6.9	2,776	2,895	....	119	4.1
St. P. & Duluth	175	175	.....	.....	.....	517,351	367,014	150,337	.....	40.9	2,956	2,097	859	....	40.9
St. P., Minn. & Manitoba	926	756	170	....	22.5	4,484 330	2,355,768	2,148,562	.....	92.0	4,843	3,090	1753	....	56.5
Scioto Valley	128	108	20	....	18.5	279,614	204,036	75,578	.....	37.0	2,185	1,889	296	....	15.6
South Carolina	243	243	.....	.....	.....	646,785	648,514	.....	1,729	0.3	2,662	2,639	....	7	0.3
Tol., Cin. & St. L.	424	328	96	....	29 3	509,807	341,705	168,102	.....	49.2	1,202	1,044	158	....	15 1
Union Pacific	3,723	3,410	313	....	9.0	15,400.000	13,490,000	1,910,000	.....	14.2	4,136	3,956	180	....	4.4
Wab., St. L. & Pac.	3,350	2,480	870	....	35.1	8,8 0,085	7,359,017	1,471,068	.....	20.0	2,636	2,967	....	331	11.2
Wisconsin Central	520	520	....	....	.....	1,007,364	739,692	267,672	.....	36.2	1,937	1,423	514	....	36.2
Total, 62 roads	49,470	43,877	5,593	....	.....	198,633,720	176,708,727	23,256,280	1,331,287	.....	4,015	4,027	....	12	.....
Total inc. or dec.	.....	.....	5,593	....	12.7	.....	.....	21,924,993	.....	12.4	.....	.....	....	12	0.3

* Roads marked thus are not in the table of earnings for July. † Includes all lines east of Pittsburgh and Erie

and through Chicago for the week ending Aug. 21 we are not able to give this week.

LAKE RATES have fallen, and for nearly a week past have been nearly as low as the lowest ever known, namely, 1½ cents a bushel for corn and 1¾ for wheat from Chicago or Milwaukee to Buffalo. The shipments are small, and probably would cease altogether but that the vessels get 75 or 80 cents a ton for carrying coal up the lakes, from Buffalo to Chicago. As it is, the shipments are chiefly by propellers of the regular transportation lines, which carry considerable merchandise freight up the lakes.

Canal rates remain stationary at 4¾ cents a bushel for corn and 5¼ for wheat from Buffalo to New York.

Ocean rates have advanced considerably. Recent quotations on grain, by steam from New York to Liverpool, are 5½d., 5¾d. and 6d., and the same day a contract was made to carry from Baltimore at 7d.

NEW ORLEANS GRAIN EXPORTS have been resumed since the new winter wheat crop began to come forward, and in the four weeks ending with Aug. 19 they were 735,405 bushels, against 672,012 bushels in all the year before. They can hardly be said to have become important, however, as in these four weeks about 14,745,000 bushels were exported from the other Atlantic ports, and the New Orleans exports were but about 5 per cent. of the whole.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Ohio Central, annual meeting, in Toledo, O., Sept. 13. Transfer books closed Aug. 23.

Northern Pacific, annual meeting, at the office in New York, Sept. 19. Transfer books close Sept. 6.

Railroad Conventions.

The *Railway Traveling Auditors' Association* will hold an adjourned meeting at the Louisville Hotel, Louisville, Ky., on Wednesday, Sept. 13, at 11 a. m. Members of the Association are requested to attend. All others desiring to become members are cordially invited on that occasion.

The *National Association of General Passenger & Ticket Agents* will hold its next semi-annual meeting at the Windsor Hotel, in Montreal, Sept. 19, beginning at 11 a. m.

The *Master Car-Painters' Association* will hold its annual convention in Chicago, beginning Sept. 20.

The *Master Car-Builders' Association* will meet in convention, pursuant to adjournment, on Oct. 10, at Niagara Falls.

The *American Society of Mechanical Engineers* will hold its stated annual meeting in New York, Nov. 2. Arrangements for the meeting will be announced hereafter.

Dividends.

Dividends have been declared as follows:

Chicago, Burlington & Quincy, 2 per cent., quarterly, payable Sept. 15.

Chicago & Northwestern, 2 per cent., quarterly, on the preferred stock, payable Sept. 26. Transfer books close Sept. 7.

North Carolina (leased to Richmond & Danville), 3 per cent., being one-half of the yearly dividend, payable Sept. 1. The other half was paid in March last.

Iowa Falls & Sioux City (leased to Illinois Central), 1¾ per cent., payable Sept. 1.

Boston & Albany, 2 per cent., quarterly, payable Sept. 30. Transfer books close Aug. 31.

Foreclosure Sales.

The *Bedford, Springville, Owensboro & Bloomfield* road was not sold under foreclosure last week, although the sale was announced in a press dispatch. The sale made was of $350,000 first mortgage bonds and $850,000 stock, under an order of the United States Circuit Court, and was by the assignee of Conley, Mason & Co., the contractors who owned the road. The whole lot of bonds and stock was bought for $200,000 by Aquilla Jones, for account of the Indianapolis Rolling Mill Company, the chief creditor of the contractors. The dispatch last week gave $1,200,000, the par value of the securities, instead of the price actually paid.

The *Williamstown* road will be sold at Woodbury, N. J., Nov. 25, under foreclosure of a mortgage for $250,000. The road extends from Atco, N. J., to Williamstown, 9½ miles. It has never earned much more than its running expenses. Most of the bonds are owned by President Freeman, of the Camden & Atlantic Company.

ELECTIONS AND APPOINTMENTS.

Atlantic & French Broad.—At a meeting held in in Belton, S. C., Aug. 17, the following directors were chosen: Lewis Jones, A. J. Norris, F. H. Wardlaw, T. H. Clark, G. W. Wise, P. G. Rockwell, T. J. Croft, B. H. Teague, W. H. Brawley, Gov. Johnson Hagood, James Callison, A. T. Wildeman, J. S. Cothran, L. W. White, R. W. Hadden, W. C. Brown, B. C. Martin, W. S. Pickens, R. E. Bowen, D. F. Bradley. The board elected the following officers: President, R. E. Bowen, Pickens, S. C.; Vice-President, Lewis Jones, Edgefield, S. C.; Secretary and Treasurer, Wardlaw Ferrin, Abbeville, S. C.; Chief Engineer and Superintendent, W. J. Kirk.

Burlington & Ohio River.—The following is a list of the officers of this company: Geo. P. Merrill, First Vice-President and General Manager; W. C. Shirley, Second Vice-President; W. F. Garis, Assistant General Superintendent and Consulting Engineer; Col. C. W. Garis, Superintendent of Construction; M. McClure, Treasurer; L. C. Glessner, Secretary. The offices are in St. Louis.

Canadian Pacific.—The office of Mr. Henry Wood, Railway Inspector, has been removed from Montreal to Masville, Glengarry County, Ontario.

Cleveland, Columbus, Cincinnati & Indianapolis.—The following appointments have been made, and took effect Aug. 28.: Mr. T. W. Burrows, Assistant Superintendent Columbus and Cincinnati divisions, with office at Cincinnati, O.; Mr. E. A. Peck, Train-Master Cincinnati Division, with office at Delaware, O.; Mr. C. J. Stedwell, Train-Master Columbus Division, with office at Cleveland, Ohio.

Florida Central & Western.—The following appointments have been made in consequence of the death of General Superintendent J. P. Laird: James S. McElroy, Master of Transportation and Machinery; W. W. Lee, Master of Roadway; Thomas Whitworth, Assistant Master of Roadway. Offices at Tallahassee, Fla.

Garfield & Cherry Grove.—Col. James O. McClure has been appointed Chief Engineer, with headquarters at Sheffield, Pa.

Grand Trunk.—Mr. Joseph C. Young has been appointed General Western Agent, with office in Milwaukee, Wis.

Mr. Charles Stiff is appointed Superintendent of the Great Western Division, including the lines of the former Great Western Railway. Mr. Thomas Tandy is appointed General Freight Agent of the Great Western Division, with office at Hamilton, Ont. It is understood that no changes will be made in subordinate positions.

Hot Springs & Mountain Valley.—The directors of this new company are, G. G. Lotta, D. C. Ring, S. H. Smith, Hot Springs, Ark.; S. Ward, Little Rock, Ark.; S. W. Fordyce, St. Louis.

Kanawha & Chesapeake.—At a meeting held in New York, Aug. 28, the following directors were chosen: J. E. Gates, W. H. Hageman, James B. Hawes, C. P. Huntington, Edward H. Pardee. The company is controlled by the Chesapeake & Ohio.

Louisville & Nashville.—Mr. E. H. Mann has been appointed Train-Master of the Louisville, Cincinnati & Lexington Division in place of J. A. Drew, resigned. Mr. J. M. Neely succeeds Mr. Mann as Train Dispatcher and Chief Operator of the division.

New York, Chicago & St. Louis.—Mr. James P. Curry has been appointed Auditor. He has been for some time Secretary and Auditor of the Scioto Valley Company.

New York, Ontario & Western.—The office of General Superintendent J. E. Childs was, on Aug. 21, removed from Middletown, N. Y., to No. 35 Wall street, New York city.

Northern Pacific.—Mr. E. H. C. Taylor has been appointed Auditor of the Western divisions, with office at Portland, Oregon, and assumed charge of the accounts of those divisions on Aug. 14.

Ohio River & Indiana.—The directors of this new company have elected James Wilson, Jr., President; J. C. Hasenear, Vice-President; C. W. Timmermeister, Secretary; W. S. Rogers, Treasurer; C. A. Layton, General Attorney.

Paducah & Chicago.—The directors of this new company are: George S. Wilks, Jabez M. Woodward, Thomas S. Ridgeway, Robert Reid, Edward C. Elliott, Frederick S. Myers. Office at Shawneetown, Ill.

Sinaloa & Durango.—Mr. M. N. Fickinger has been appointed Superintendent, with office at Altata, Mexico. He was recently on the Lake Shore & Michigan Southern road.

Sioux City & Pacific.—P. E. Robinson having resigned the office of Assistant General Passenger Agent, that office is hereby abolished. All reports, statements and correspondence heretofore sent him will hereafter be sent to J. R. Buchanan, General Passenger Agent, at Missouri Valley, Iowa.

Union Pacific.—General Superintendent J. T. Clark, of the Union Division, having resigned to go to the Chicago, Milwaukee & St. Paul, the office is abolished. The road will hereafter be divided into four general divisions, with officers as follows:

Mr. S. H. Smith continues General Superintendent of the Kansas Division, including the Kansas Pacific and branches and the Kansas Central. Office at Kansas City, Mo.

Mr. P. J. Nichols is appointed General Superintendent of the Nebraska Division, including the Union Pacific main line and all branches east of Cheyenne. Office in Omaha, Neb.

Mr Robert Law is appointed General Superintendent of the Wyoming Division, including all lines west of Cheyenne. Office at Cheyenne, Wyoming.

Mr. A. A. Egbert is appointed General Superintendent of the Colorado Division, including the Colorado Central, Greeley, Salt Lake & Pacific, Georgetown, Breckenridge & Leadville, Denver, Western & Pacific, Denver & South Park and all the branches. Office at Denver, Col.

Mr. I. H. Congdon (heretofore General Master Mechanic, Union Division) is appointed Superintendent of Motive Power and Car Department for all the company's lines. Office in Omaha.

Mr. E. Lane is appointed Superintendent of Bridges and Buildings for all the company's lines. Office in Omaha.

PERSONAL.

—Mr. Thomas H. Bransford, for a number of years Freight Agent of the Richmond & Petersburg road in Richmond, has resigned that position to accept the joint agency of the Norfolk & Western and the Shenandoah Valley roads at Roanoke, Va.

—Mr. F. M. Hutchinson, for a long time Secretary and Treasurer of the Pittsburgh, Fort Wayne & Chicago Company, died Aug. 27. He was a son-in-law of Mr. G. W. Cass, President of the Company.

—Mr. Charles E. Pugh, now General Superintendent of the Pennsylvania Railroad Division, is named as a probable successor to Mr. Frank Thompson as General Manager, in case of Mr. Thompson's promotion to the vice-presidency on the retirement of Mr. Cassatt. It may be remarked here that several lists of new officers for the Pennsylvania have been made and are going the rounds of the papers. These lists are based on mere conjecture, or are at best shrewd guesses at the officers who stand most in the way of promotion. It is safest to make no announcements until the official list is made up.

—Mr. F. Broughton, General Manager of the Great Western Railway, is retired by the consolidation of that road with the Grand Trunk, after seven years of service. Of his administration of the road the Hamilton (Ont.) *Spectator* says: "When Mr. Broughton assumed the general management of the Great Western Railway in 1875 he was compelled to do some things that were both unpleasant and unpopular. He was compelled to dismiss some employés of the company whose services he believed to be unprofitable, to withdraw privileges which many people had enjoyed, and in various ways to reduce the working expenses of the road. For that reason some people have said hard things of him, and some of these hard things are still repeated and believed. But paying little attention to what was said of him, the new Manager set himself resolutely to work to improve the condition of the company's property and to make it earn divi-

dends for the proprietors. His work has been arduous; and the measure of success which has attended his efforts has not equaled his expectations. So far as putting the road and the business of the road into the best possible condition are concerned he achieved everything. * * Mr. Broughton carries with him in his retirement not only the hearty respect of the people of Hamilton, but the most lively good-will of the employés of the company, who entertain for him the warmest feelings of admiration. His administration has been characterized by strict regard for the interests of the proprietors, and he has sought to be just rather than popular, and he will long be held in grateful remembrance by those who have served under him."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows :

	1882.	1881.	Inc. or Dec.	P. c.
Three months ending July 31 :				
Louis., N. A. & Chi.	$335,699	$238,174	I. $97,525	41.0
Month of July:				
Utah Central.....	$115,589	$100,630	I. $14,959	14.9
Net earnings.....	61,940	61,485	I. 455	0.7
Third week in August :				
Bur., Ced. R. & No.	$49,225	$49,857	D. $633	1.3
Ches. & Ohio.....	84,819	49,605	I. 35,214	71.0
Chi. & Eastern Ill..	41,539	42 453	D. 914	2.1
Chi. & Gd. Trunk.	36.035	32,920	I. 3,115	9.4
Chi. & Northwest..	440,315	490,300	D. 49,985	10.2
Chi. St. P., M. & O.	86,044	78,929	I. 8,015	10.3
Denver & R. G.....	122,183	128,089	D. 6.495	5.0
Long Island.....	74,758	68,811	I. 5,947	8.6
Louisv. & Nashv...	235,795	195,300	I. 39,995	20.4
Mo. Pacific lines....	670,052	570,954	I. 99,098	17.3
Northern Pacific...	156,700	98,020	I. 58'680	59.9
St. P., Min. & Man.	180,076	91,645	I. 88,431	96.1
Tol., Cin. & St. L....	20,937	19,774	I. 1,163	5.9
Wab., St. L. & P...	512,831	427,145	I. 85,686	20.1

Year.	Northwestern receipts.	Total.	—Northwestern shipments.— By rail.	P. c. by rail.	Atlantic receipts.
1876	4,280,052	3,872,963	1,520,811	39.3	3,227,690
1877	5,331,315	4,632,809	1,036,221	22.6	4,493,252
1878....	9,015,180	5,725,812	1,304,453	22.8	6,823,013
1879....	6,559,199	6,238,710	1,818,087	29.1	7,429,649
1880....	7,747,247	6,789,435	2,032,203	29.9	7,666,271
1881....	7,502,463	5,409,136	2,459,061	45.5	5,324,453
1882	4,989,471	4,506,555	1,891,578	41.1	5,539,993

The receipts of the Northwestern markets for the week were smaller than in any corresponding week since 1876 and a third less than last year. They were, however, 1,486,000 bushels more than in the previous week of this year, but were exceeded in each of the three weeks before that.

The shipments of these markets were also smaller than in any corresponding week since 1876, and 15 per cent. less than last year; but they were 665,000 bushels more than in the previous week of this year, and with the exception of the two weeks ending Aug. 5 are the largest of this year. The rail shipments were, with one exception, the largest since navigation opened, and the river shipments were 240,971 bushels, or 5.3 per cent. of the whole.

The Atlantic receipts were a little larger than in the corresponding week of last year, but smaller than in any other since 1877. They were 260,000 bushels more than in the previous week of this year, and with one exception are the largest since the middle of September last year.

Of the Northwestern receipts, Chicago had 37.6 per cent., St. Louis 30.3, Toledo 13, Peoria 10.9, Cleveland 4.3, Milwaukee 1.9, Duluth 1.2, and Detroit 0.8 per cent.

Of the increase of 1,486,000 bushels over the previous week, 623,000 bushels were at Chicago, 373,000 at St. Louis, 301,000 at Peoria, and 194,000 at Toledo. The Peoria receipts are the largest since April, and more than twice as great as in any other recent week. They are three-fifths oats and one-third corn. Oats make an extraordinary figure in the total Northwestern receipts—about one-third of the whole and more than corn, while in the corresponding week of last year the corn receipts were five times the oats receipts.

Of the Atlantic receipts New York had 43.4 per cent., Baltimore 10.9, Philadelphia 13.8, New Orleans 12.2, Montreal 5.3, Boston 5.2, and Portland 0.2 per cent. Compared with the previous week, there is a gain of 600,000 bushels at New York, of 415,000 at New Orleans, and of 120,000 at Philadelphia, but a loss of 754,000 at Baltimore, and of 119,000 at Montreal. The receipts of New Orleans are the largest since the first week of July last year, and were exceeded but in five weeks of 1881, and in but two of 1880. Its receipts were nearly all wheat, which indicates that they were for export, as New Orleans does not grind wheat to any extent.

Of the exports of the week, 45.2 per cent. were from New York, 21.9 from Baltimore, 15.5 from Philadelphia, 8.4 from Montreal, 5 from New Orleans, and 4 from Boston. More than 98 per cent of these exports were wheat.

For the week ending Aug. 23 the exports have been:

	1880.	1881.	1882.
Flour, bbs	110,191	106,193	99,298
Grain, bu	6,444,497	4,138,884	4,109,504

The exports were thus nearly the same this year as last, but 36 per cent. less than in 1880.

For the week ending Aug. 26 receipts and shipments at Chicago and Milwaukee were:

	—Receipts.— 1882.	1881.	—Shipments.— 1882.	1881.
Chicago.....	3,094,349	4,902,128	2,804,291	4,179,323
Milwaukee.....	155,985	373,105	82,018	494,603
Both	3,250,334	5,275,233	2,886,309	4,673,926

This is a decrease of 2,025,000 bushels (36½ per cent.) in receipts and of 38 per cent. in shipments

For the week ending Aug. 26, receipts and shipments at Buffalo were:

	—Receipts.— 1882.	1881.	—Shipments.— 1882.	1881.
By rail.....	1,512,200	733,500	1,263,570	1,301,250
By water.....	1,356,000	1,928,500	1,058,935	1,010,750
Total.....	2,868,200	2,662,000	2,322,505	2,312,000

The receipts this year are 8 per cent. greater and the shipments about the same as last year. But contrary to the course of things heretofore, there is a great increase in receipts *by rail*, though rail rates are about twice as high as last year. This is probably because the receipts are largely of wheat from such roads as the Wabash and the Bee Line which reach the lake first as far east as Toledo and Cleveland—so far east that it does not pay to transfer.

For the week ending Aug. 26 receipts at four Eastern ports were :

Bushels:	New York.	Boston.	Phila.	Baltimore.	Total.
1882.....	2,592,091	269,725	921,600	952,577	4,735,993
1881.....	2,666,319	578,065	539,900	1,156.745	4,941,029
1880.....	3,566,908	524,035	1,090,800	1,536,884	6,718,627
P. c. of total:					
1882.....	54.7	5.7	19.5	20.1	100.0
1881.....	54.0	11.7	10.9	23.4	100.0
1880.....	53.1	7.8	16.2	22.9	100.0

Philadelphia and Baltimore together had 39.6 per cent. of the whole this year, against 34.3 last year and 39.1 in 1880. The notable feature of the week is a large increase in the Philadelphia receipts, those of Baltimore falling off a little. This may be because the wheat and oats on the lines of the the Pennsylvania Railroad in the west, which are mostly north of those of the Baltimore & Ohio, are now first beginning to come forward. 94 per cent. of the Baltimore receipts last week were wheat, but only 58½ per cent. of the Philadelphia receipts.

Of the New York receipts, 1,284,542 bushels (39.5 per cent.) were by rail this year, against 1,552,535 bushels (58.2 per cent.) last year, and 1,037,746 bushels (29 per cent.) in 1880. The earnings from these rail receipts, if the average distance hauled was the same in all years, must have been about at the rate of $100 this year for every $72.50 last year and every $97 in 1880.

Receipts and shipments of wheat, corn and oats from Chicago, Milwaukee, Detroit, Toledo, Indianapolis and Peoria for the last four weeks have been:

Week to	—Receipts.— Wheat.	Corn.	Oats.	—Shipments.— Wheat.	Corn.	Oats.
Aug. 7..	1,784,2 8	1,004,752	318,235	2,248,738	955,051	442,577
" 14..	9 6,261	1,087,498	535,050	1,332,449	935,102	492,523
" 21..1	1,188,838	1,370,026	1,372,962	1,297,303	1,194,078	893,175
" 28..1	1,397,951	1,117,684	1,516,533	1,085,197	1,203,821	1,406,026

The wheat receipts, which fell off largely after the first week of August, are increasing, and the oat receipts and shipments are enormous, and make the total movement (in bushels) larger than before this summer. In weight, however, it must be remembered that the 1,516,553 bushels of oats received last week are equal to but 866,000 bushels of corn, or 808,828 of wheat.

Coal Movement.

Coal tonnages for the week ending Aug. 19 are reported as follows :

	1882.	1881.	Inc. or Dec.	P. c.
Anthracite.....	644,476	599,684	I. 44,792	7.5
Semi-bituminous... ..	86,671	102,236	D. 15,565	15.3
Bituminous, Penna....	42,702	47,494	D. 4,789	10.1
Coke, Penna.....	47,694	41,952	I. 5,742	13.7

The bituminous trade in Western Pennsylvania shows a reduction, which is probably largely due to the iron strike. Coke traffic is improving again.

The coal tonnage of the Pennsylvania Railroad for the week ending Aug. 19, was: Coal, 157,112 ; coke, 47,694 ; total, 204,806 tons. The total tonnage this year to Aug. 19 was 6,897,613 tons.

Cumberland coal tonnage for the week ending Aug. 26, as reported by the Cumberland *Civilian*, was 18,684 tons. Of this 10,146 tons were shipped over the Cumberland & Pennsylvania road, and 8,468 tons over the West Virginia Central & Pittsburgh road. The total tonnage this year to Aug. 26 was 628,463 tons.

Grain Movement.

For the week ending Aug. 19 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the last seven years:

New York Canal Traffic.

For the week ending Aug. 22 the Canal Auditor reports:

	1882.	1881.	Inc. or Dec.	P. c.
Tons shipped.....	201,276	225,195	Dec. 24,019	10.7
Miles cleared by boats.....	270,736	287,161	Dec. 16,425	5.7
Tolls.....	$28,725	$27,383	Inc. 1,342	4.9

The quantities of leading articles shipped were:

	1882.	1881.	Inc. or Dec.	P. c
Lumber.....	60,106	67,687	Dec. 7,531	11.1
Grain.....	43,754	41,423	Inc. 2,331	5.6
Iron and iron ore.....	17,418	22,680	Dec. 5,262	23.2
Stone, clay and lime.....	10,564	12,991	Dec. 2,427	18.7
Salt.....	4,075	6,481	Dec. 2,406	37.1
Coal.....	46,981	53,523	Dec. 6,542	12.2
Domestic woolens and cottons...	24	275	Dec. 251	9.1
Sugar, molasses and coffee.....	493	138	Inc. 355	25.7

There is thus an increase this year only in grain and sugar, molasses and coffee. The grain shipments are very small this year, but they were extremely small last year. The rail rates are so much higher this year that an increase in the canal shipments of the more valuable articles was to be expected. It is seen in molasses and coffee, but not in woolens and cottons.

Crop Prospects.

By the latest reports farmers were engaged in cutting wheat along the line of the Northern Pacific. There had been some unfavorable rains, but no damage is reported. The grain is mostly, but not all, secured in stack as far north as the Hastings & Dakota road. The weather has been favorable for corn in nearly all the corn-growing country, and about all it needs now is for the frost to hold off for about a month longer. There will not be a full crop, however, in any of the great corn-growing states except Kansas and Nebraska, but a great deal more than last year unless it suffers from the frost.

Pacific Coast Freight Rates.

A dispatch from San Francisco, Aug. 29, says: "The railroad conference between the representatives of the Central and Union Pacific roads relative to the proposed reduction of the freight tariff between points in this state and Utah, Montana and Idaho is almost concluded. The only matter of public interest is that California shippers are hereafter to be guaranteed the same rates to points in Idaho, Utah and Montana reached by the roads controlled by the Union Pacific as are made from Omaha. The conference also agreed that Colorado freight may go *via* the northern line at the same rate as on the southern route."

Half Fare to Employes.

The following resolution was passed at a meeting of the general passenger agents of the trunk line Aug. 10, and has been sent to the connecting lines:

"*Resolved*, That connecting lines may be authorized to issue special tickets at half the unlimited fares to employés of their roads on connecting roads, upon the requisition of some general officer of the lines to which such employés belong. Such tickets shall be issued only to trunk line points. Statements of these requests shall be made monthly to the Secretary. The trunk lines may adopt the same rule westbound, reporting as before to the Secretary."

"Common Points" with New York, Boston, Philadelphia and Baltimore, and with Buffalo, Pittsburgh and Chicago.

Commissioner Daniels of the Iowa Trunk Lines Association has issued a circular which defines as follows the term "common points," used in the Association's announcements relating to west-bound traffic :

"Boston, New York, Philadelphia, Baltimore, and points common thereto, will be understood to include, in addition to the above-named cities, the following : All through-billing lines on the Boston & Albany and Hoosac Tunnel lines in Massachusetts; Albany and Troy, on the New York Central; Newport, Paterson, Newburg, Port Jervis, Middletown, Binghamton, Owego, Waverly, Elmira, Corning and Hornellsville, on the New York, Lake Erie & Western Railway; all through-billing points on the Pennsylvania Railroad between New York and Philadelphia, and from stations on the main line of the same road east of Pittsburgh; stations on the main line of the Baltimore & Ohio Railroad east of Cumberland; and Richmond, Va., and other points on the Chesapeake & Ohio which take Richmond rates.

"Common points to Buffalo are Black Rock, Suspension Bridge, N. Y., and Erie, Pa. Common points to Pittsburgh, Pa., are Beaver Falls, Pa.; Point Bridge, Pa.: New Brighton, Pa.; Rochester, Pa.; Allegheny, Pa.; Washington, Pa.; Mansfield, Pa.; Wheeling, W. Va.; Wellsburg, W. Va.; Martin's Ferry, W. Va.; Bridgeport, O.; Steubenville, O.; Salem, O.; Jacobus, O.; Leesdale, Pa. Common points to Chicago are South Chicago, Englewood; Racine, Wis.; Milwaukee, Wis.; Racine Junction, Wis.: Kenosha, Wis.; Washington Heights, Joliet, Sheldon, Ill."

Western Weighing Association.

The Western Weighing Association during the month of July weighed 49,191 cars of freight, against 46,070 during the month of June.

THE SCRAP HEAP.

Locomotive Building.

The Dickson Manufacturing Co., at Scranton, Pa., has an order for 25 consolidation engines for the New York, West Shore & Buffalo road.

The Cooke Locomotive works at Paterson, N. J., have an order for 25 very heavy freight engines for the Central Pacific road. These engines will have eight driving wheels and a four-wheeled truck; the cylinders will be 20 by 30 in. and the engines will weigh 62 tons each, without tenders. The first engine of this order is nearly finished.

The Baldwin Locomotive Works in Philadelphia are to build 75 engines for the New York, West Shore & Buffalo road.

The Brooks Locomotive Works in Dunkirk, N. Y., turned out 19 engines last month. They are still busy on heavy contracts for the New York, Chicago & St. Louis, and the Atlantic & Pacific road.

Car Notes.

The Indianapolis Car Works have taken a contract for 1,000 box cars for the New York, Chicago & St. Louis road.

The Buffalo, Pittsburgh & Western shops in Oil City, Pa., have just completed a new parlor car, and are building a very handsome directors' car for the road.

The Barney & Smith Manufacturing Co. at Dayton, O., now employ about 1,200 men, and have orders for several months ahead. A large new steam hammer has lately been put in.

The Ward Axle, Brake & Coupling Co. has bought the buildings of the Monongahela Manufacturing Co. at Monongahela City, Pa., and will soon begin there the manufacture of the Ward patent axle brake and the Ward car coupler. The works will also make turn-tables on the plan designed by Mr. W. H. Ward. These turn-tables have been in use successfully for a number of years.

Bowler & Co. in Cleveland, O., have lately enlarged their foundry, nearly doubling their capacity for making car wheels. They have also put up a new shop 50 by 80 ft., for fitting wheels on axles.

Bridge Notes.

The Pittsburgh Bridge Co. has just taken a contract for three highway bridges in Frederick County, Md., to be 173 ft. span each.

The Clinton Bridge Co. at Clinton, Ia., has lately taken contracts for several Howe-truss and combination bridges.

Iron and Manufacturing Notes.

The American Railway Signal Co., of Illinois, has been organized in Chicago, with the object of purchasing and using the right to manufacture and sell improved electric signals; capital stock, $3,000,000; incorporators, Wm. W. Boynton, David E. McConkey and Wm. C. Duell.

Mr. Samuel R. Seyfert will enlarge his rolling mill at Naomi, Pa., by a new puddling mill 168 by 66 ft. The machinery has been ordered at the Scott Foundry in Reading.

The new blast furnace of the Ogden Iron Works at Ogden, Utah, is completed and was started last week

Moselem Furnace in Berks County, Pa., has been repaired, and will go into blast next week.

Sharpe & Daniels are running the rolling mill at Alikanna, O., on a very heavy contract for hoop iron for the Standard Oil Co. They are making 20 tons a day.

The Pittsburgh Bessemer Steel Works, at Homestead, have shut down. It has not been decided when work will be resumed.—*Pittsburgh Manufacturer.*

A casting weighing 20,000 lbs. was made at Pottstown, Pa., last week. It was a conical drum for a hoisting engine and is 16½ ft. in diameter at the large end. It is intended for the No. 4 slope of the Brookside mine. Another similar one will be made, and the two will be bolted together, with a large wheel weighing 18,000 lbs. between, the whole machine when completed weighing not less than 30 tons.

The machinery is being put in the new rolling mill of the Ward Iron Co. at New Philadelphia, O., and the mill will probably be ready to start about Nov. 1. It will be one of the largest mills in Eastern Ohio.

The Rail Market.

Steel Rails.—The market is quiet, but with more inquiries. No heavy sales are reported. Quotations are $49 to $50 per ton at mill for immediate delivery, and $47 to $48 for late orders.

Iron Rails.—Quotations continue at $45 to $47 per ton at mill. The market is quiet but firm, and a fair business is looked for, especially in light rails.

Rail Fastenings.—Spikes are quoted at $3 per 100 lbs., with a better supply than for some time past. Fish-plates are still quoted at $2.50 to $2.70 per 100 lbs., and track bolts at $3.75 to $4.25, the last-named price for hexagon nuts.

Old Rails.—Some small lots have been offered, but few sales are reported. Prices are about $27.50 to $28 per ton in Philadelphia for tees, and $28 to $29 for double-heads.

A Large Lake Steamer.

The new iron steamer, "Hugh J. Jewett," built by the Union Dry Dock Co., of Buffalo, for the Union Steamboat Co., was launched last week. The boat is thus described by the Buffalo *Commercial:* "The dimensions are as follows: Length of keel, 266 ft.; length all over, 287 ft.; breadth of beam, 39 ft. 8 in.; depth of hold, 25 ft. She is subdivided into five freight carrying compartments, which are separated by water-tight bulkheads.

"The wheat carrying capacity of these compartments is estimated as follows: The first, 17,885 bushels; the second, 20,000; the third, 18,300; the fourth, 18,000, and the fifth 3,500. This is a total of 77,685 bushels under the main

deck. On the upper deck she has room for 30,000 bushels, but this part will be used for coarse freight. The bulkheads are six in number. The main deck has eight hatchways, and on each side of the boat there are five gangways for taking in cargo.

"Great pains have been taken to make this boat strong and safe. She is built with a water bottom or ballast hold. There is a series of eight distinct water-tight compartments on the bottom, four on each side of the keel They are 3½ ft. deep and serve the triple purpose of protecting the cargo; helping to save the boat in case of a hole being knocked in her bottom, and by being filled with water provide ballast when the boat is in need of it.

"The iron plating ranges from ¾ in. thick at the keel to ⅝ in. at the two strakes in the wake of the gangways. The iron work throughout is very heavy and it is safe to say that no boat was ever put together more substantially.

"The quarters of the officers and crew on the main deck are to be fitted up comfortably. They will be nicely finished and provided with all the comforts desired by any reasonable navigator.

"The 'Jewett' will have three spars, the foremast being 102 ft. high, the main 104 and the mizzen 95 ft. She will spread about 1,200 yards of canvas.

"The motive power of the boat is a double compound Perry & Lay engine made by Henry G. Traut. The upper cylinder will be 22 in. in diameter, and the lower one 42 in., the stroke being 4 ft. The boilers are of ¾-in. Otis steel. They are each 16 ft. long, and 9½ ft. shell, and will be allowed to carry 130 pounds of steam. The wheel is 13 ft. in diameter, and weighs about four tons.

"The estimated carrying capacity of the boat is from 2,700 to 2,800 tons, equal to over 90,000 bushels of wheat, and nearly 100,000 bushels of corn. Her cost is placed at nearly $225,000."

Rain.

They don't have rains out West. A cloud just saunters up and examines a town and then collapses right over it. Nobody escapes but the newspaper reporters and the book agents.—*Atlanta Constitution.* And the train-boy. No mere cloud can kill him.

There was a funny chase for a baby at Plainville, Conn., the other morning. A woman stepped from a train a moment to question the agent and the train pulled out suddenly without her, carrying off her baby. Her frenzy moved the good ticket agent to telegraph to Bristol and order the baby returned. The train dropped the infant at Forestville and a good man footed it thither and lugged the baby back to Plainville. The mother, meantime grown impatient, had gone to Forestville on the engine of a gravel train. So back went the good man with the baby to Forestville, there to learn that the frantic mother had returned to Plainville. The man then telephoned to the woman to sit still half an hour, which she did, and got back her infant.

American Institute Fair.

The Fifty-first Industrial Exposition of the American Institute in New York will begin Sept. 27 next, and applications for space are already unusually large. There will be the usual display of manufactures and new inventions, and the managers expect to present unusual attractions. Mr. Charles Wager Hull will continue Superintendent, and Mr. John W. Chambers, Secretary.

Telegraphing The Precise Time.

For a long time the firm of M. S. Smith & Co. and the Michigan Central Railroad Company have been in the habit of obtaining the time to regulate their clocks from the observatory at Ann Arbor. Twice a week the regulating was done, an operator going from Jackson to Ann Arbor. But telegraphing by hand was likely to result in slight errors, and the method was not the most satisfactory. Mr. A. T. Hill, of the firm of M. S. Smith & Co, has invented and perfected a device for telegraphing to any given point the precise time. A large clock of the usual kind will be placed in the observatory at Ann Arbor and astronomically regulated. Connected with this is a secondary clock which will run two minutes each day, beginning at 11:59 a. m. and stopping at 12:01 p. m. When it begins to run it automatically operates a telegraphic sounder, which for the first minute strikes once a second, and at noon begins a peculiar and unmistakable double "click-click," continuing for one minute. Now the Michigan Central Railroad Company furnish the use of a wire to Detroit, for the sake of getting accurate time. At M. S. Smith & Co.'s stores a sounding bell will be rung, the one stroke per second for the first minute calling attention to the fact that it is nearly noon. All watches can be pulled out and set at 12 o'clock, and when the double stroke begins the owners of the timepieces know that it is 12 o'clock. The Board of Trade, engine houses and City Hall will be connected with the circuit. The device is very complete in its minute details. For instance, if the secondary clock should be out of order and stop, at the end of three minutes the large clock switches the line out, so that the wire can again be used for telegraphic purposes.—*Detroit Post and Tribune.*

The Baltimore Car-Wheel Works.

The two new buildings just put up by this company are the machine shop and the foundry. The former is a two-story structure; its dimensions are 125 by 100 ft., and in this will be placed all of the latest and most improved machinery for finishing wheels, the motive power being furnished by a 180 horse-power automatic cut-off engine. This building is heated by steam, and all the paint in the same, as well as in the foundry, is of the fire-proof kind, so as to reduce the danger from fire to a minimum.

The foundry is 400 ft. long by 100 wide, its immense roof being supported by huge wooden beams, strengthened and braced by iron rods and girders. Three cupolas, two large and one small, each having a capacity of 10 tons of metal to the hour, will be built and 40 cranes erected, each surrounded by an annealing pit 10 ft. deep, and with space for 100 wheels. The total capacity of this foundry per day is from 600 to 800 wheels. Immediately adjoining this building are the cupola-house and boiler-room, both constructed of hard brick, and the sand-shed, the latter provided with chutes near the roof, so that the sand can be dumped into it directly from the cars of the Baltimore & Potomac road, which enter the grounds through a gateway from the western boundary of the property. Situated on higher ground, several hundred rods distant from the foundry, is a handsome block-stone building, about 50 ft. long, 30 ft. wide and two stories high, which will be used for the offices of the company, and will be connected with the workshops by electric bells, telephones and other modern appliances.—*Baltimore Day.*

The Accident at Franklin.

The Massachusetts Railroad Commissioners publish the following report upon the accident at Franklin, on the New York & New England Railroad, on Sunday, Aug. 20: This was the derailment of part of a freight train, at the beet sugar factory, on the New York & New England Railroad, about half a mile west of Franklin. It was investigated, as some other cases have been, not so much on account of what happened, but because of what might have happened. A misplaced switch which caused the derailment of a freight train might cause the derailment of a passenger train, with the most serious consequences. And it seems well not to wait for a fatal disaster before calling attention to the causes which tend to produce such disasters. The numerous accidents recently, resulting from the misplacement of switches, make it especially desirable to investigate all such cases. In this case the supervisor of the road was directed to extend the double track from Franklin station to the beet sugar factory. The work was to be done on Sunday, and notice was given to the Superintendent at Hartford that all facilities would be needed in order to have the change made during the day. The supervisor made the desired extension, united the New York & New England with the Rhode Island & Massachusetts Railroad, and at a point 50 ft. east of this connection connected the single track west of that point of the New York & New England with the inward track east of it. He then let through the switch three west-bound and four east bound trains. Having done this, he set the switch for the inward track, locked it, and left the place with no one to take charge of the switch. Going to Franklin, at 8.35 p. m, he left a message for the Superintendent at Hartford, as follows:

"Connection is made just east of beet-factory tracks at Franklin for Providence Extension and main line trains. Switch is set for inward track, and locked."

This was sent at 9:30. The supervisor had gone home without waiting for the delivery or acknowledgement of his message. The Superintendent at Hartford had taken the day for a holiday, leaving the office in charge of a train dispatcher, but he seems to have given no special directions as to this important matter. The dispatcher received the message, and called on the officer in order to have the proper notices bulletined. He failed to receive answers or to rouse the parties, and he forgot to make further application. He had been overworked, having to take the place of another dispatcher just removed for want of attention to duty, and he was that night seized with a severe fever, which still continues. Train No. 96, going east, with 20 cars of peaches, arrived at the point at 5:35 a. m., and the engine and eight cars were derailed, without injury to any person. A train (No. 13) going westward had forced its way through the switch, which was set for east-bound trains, in such a way as to lead to the accident. The points of the switch gave evidence of this, but they were repaired before an opportunity was given to examine them. It was a point switch without a spring.

1. The supervisor was guilty of gross negligence in locking the switch and leaving it without any switch-tender, and without any notice given. Even during the time spent by him in reaching the station a serious accident might have occurred. Further time elapsed before his telegram was sent, and, as it happened, a much longer time before his message took effect.

2. The Superintendent admits that he was wrong in selecting this time for a holiday without leaving special orders to guard against the possibility of accidents at this place. A switch-tender should have been stationed there, and all trains should have received notice, so that they should come to a stop at this point or approach it under full control. Other circumstances concurred with his default to make an accident possible, but that does not relieve him from blame.

3. The dispatcher acknowledges his forgetfulness, to which the accident is directly due. But the Board is not inclined to censure a man who was in the first stages of fever brought on by necessary overwork in the service of the company.

4. The managers of the company violated the law in placing in their track a switch which had not received the written approval of the board. Explanation has been made that the law and the action of the Board under it were misunderstood.

OLD AND NEW ROADS.

Atlantic & French Broad.—The consolidation of this company with the Edgefield, Trenton & Aiken was completed at a meeting held in Belton, S. C., Aug. 17. The consolidated company owns no completed road, but purposes building a line from Aiken, S. C., to the North Carolina line in the direction of London, Ky.

Baltimore & Delta.—This company has been consolidated with an old organization known as the Maryland Central, and will hereafter be known by that name. The Maryland Central never built any road, but by the consolidation the company secures a special charter with some privileges not to be had under the general law, and also a claim to an indorsement of $600,000 of its bonds by the city of Baltimore.

Baltimore & Ohio.—A dispatch from Columbus, O., Aug. 25, says: "The suit of the Baltimore & Ohio against the Pittsburgh, Cincinnati & St. Louis Railroad Company, involving the Columbus & Newark Division, and recently decided in the Court of Common Pleas, has been appealed, and is now in the District Court. Judge Collins, attorney for the Baltimore & Ohio, went before Judge Evans, as a Judge of the District Court in Chambers, and secured a temporary restraining order. It is in substance the same as the injunction allowed by the Common Pleas Court some time ago."

Boston, Concord & Montreal.—A Concord, N. H., dispatch says: "The eleventh day of the hearing before referees on the appeal of the Boston, Concord & Montreal Railroad from the decision of the State Board of Equalization taxing said road, will close to-day (Aug. 26), but briefs are to be referred to referees at an early day by Judge Ladd, counsel for the railroad, and Attorney-General Tappan for the state. In this case an immense amount of documentary and statistical evidence has been given by experts. The hearing in the tax case of the White Mountain Railroad has been postponed to a future day."

Buffalo, Pittsburgh & Western.—Contracts will be let in a few days for the extension of this company's Oil City & Chicago line from Oil City, Pa., to Jackson, 37 miles.

Track on the main line is now laid to Buffalo, 30 miles beyond the late terminus at Silver Creek. About three-quarters of a mile are still to be laid in Buffalo. From Brocton to Buffalo the track is on the same right of way as that of the New York, Chicago & St. Louis.

Buffalo & Toronto.—The Buffalo *Express* says: "It is proposed soon, we learn from good authority, to improve the connection between Buffalo and Toronto by the construction of a line of road from Fort Erie through the mountain-ridge back from Niagara River—a great obstacle to civil engineers—by a convenient opening direct to the southern end of Burlington Bay, Ont., and thence by as direct a line as possible to Toronto. A line can be found practicable, it is claimed, between Fort Erie and Toronto ten miles shorter than any at present operated.

"But the rumor reaches farther than this. It says that a new line is to be built from the Detroit River to Montreal, and thence by already established roads to New England ports. This scheme illustrates the opposition—which might have been looked for—to the Grand Trunk monopoly. The Essex Centre cut-off of the Canada Southern offers Toronto more direct connection than now exists with Detroit. By an alliance, moreover, with the Northern and Northwestern roads of Ontario, not involving, however, the independence of these lines, another connection will be made with the Canada Southern, whence direct communication with Buffalo and the lines of railway east, south and west of this city will be obtained by Toronto. Of this matter the *Globe* says: 'Everyone will understand the great benefits which this line will confer upon the cities of Toronto and Hamilton. It will give to their merchants an independent means of communication with shipping at New York which has been cut off by the union of the Grand Trunk and the Great Western. The whole influence of the former road is, of course, used to bring traffic to the ocean ports with which it connects, and Western merchants would be heavy sufferers if they did not possess a rival route for their European imports by way of the American metroplis. Again, the coal traffic, becoming yearly of greater importance, will be opened to the new line by its Buffalo connections, and no monopoly can be created in that branch while it continues in operation."'

Burlington & Ohio River.—A contract for the grading of this road from Carlinville, Ill., to Scottsville, 20 miles, has been let to J. B. Quigley & Co., of St. Louis. This makes 33 miles under contract.

California Southern.—This road is completed from San Diego, Cal., or rather from National City on San Diego Bay, northward to a connection with the Southern Pacific at Colton, 129 miles. This gives San Diego a railroad outlet for the first time. The distance by rail from the San Diego Bay terminus to Los Angeles is 187 miles, and to San Francisco 669 miles.

Canada Southern.—It is said that work will soon be begun on the branch from Essex, Ont., to Windsor, opposite Detroit. This will materially shorten the line to Detroit.

Catskill Mountains.—This road is now completed to Mountain House station, two miles beyond the late terminus at Lawrenceville, and 14 miles from the Hudson River at Catskill Landing, N. Y. The road has been doing an excellent business since its opening.

Central Iowa.—Track is reported laid on this company's Chicago, Burlington & Pacific line from Oskaloosa, Ia., eastward to Brighton, 48 miles. Work is progressing toward Burlington.

Central Vermont.—A hearing was had in the Court of Chancery at St. Albans, Vt., Aug. 25, in relation to the appointment of masters under the mandate of the Supreme Court in the Langdon case, resulting in the appointment of James M. Tyler, of Brattleboro; William H. Walker, of Ludlow; and William B. Dillingham, of Waterbury, to audit the accounts of the Central Vermont Railroad Company.

Chester & Lenoir.—At a recent meeting of the stockholders the proposition of Gen. J. D. Imboden to buy the road from Newton, N. C., to Lenoir was rejected, and a committee was appointed to consider a proposition from the Charlotte, Columbia & Augusta Company to lease the road and complete it to Lenoir.

Chicago, Burlington & Quincy.—The Nemaha Line in Nebraska has been extended from Calvert west by north about 20 miles to the Tecumseh on the Atchinson & Nebraska line, completing a shorter line from Tecumseh to Nebraska City.

Work is soon to be begun on a cut-off intended to shorten the Denver line by avoiding the detour now made from Hastings to Red Cloud, where the road runs due south for nearly 40 miles.

Chicago, Milwaukee & St. Paul.—Work has been begun on an extension of the Volga Branch of the River Division from Wadena, Ia., northwest to West Union, about 12 miles.

Work is soon to be begun on a branch from Elgin, Ill., on the Chicago & Pacific Division, northward by Geneva Lake to Elkhorn, Wis., on the Racine & Southeastern Division. The distance is about 45 miles.

Officers of the company contradict reports that it will begin a war of rates on business between Chicago and Omaha.

Chicago & West Michigan.—Tracklaying is in progress on the extension of this road from La Porte, Ind., south by west to La Crosse. The distance is 23½ miles, and most of the grading is done.

Cleveland, Columbus, Cincinnati & Indianapolis.—The Cincinnati *Gazette* of Aug. 23 says: "The following statement shows the gross earnings and operating expenses of the Cleveland, Columbus, Cincinnati & Indianapolis Railway for the seven months ending July 31, 1882, and for the corresponding period in 1881:

	1882.	1881.
Gross earnings	$2,243,904	$2,492,525
Operating expenses	1,685,269	1,666,490
Net earnings	$558,635	$826,035
Deduct taxes and interest on bonds.	370,760	342,945
Balance to credit of income	$187,874	$483,489

"In connection with the above exhibit, it is but just to say that during the first six months of this year the tonnage was quite light, and rates for transportation extremely low. Since July rates have been better, and have been well maintained, while the business moved shows a large increase in tonnage. It is expected that from now on until the close of the year the traffic of the whole line will be about equal to the road's capacity, and that the net earnings for the last half of the year will be equal to at least 6 per cent. on the capital stock of the company.

"Referring to a dividend in August, which was semi-officially promised at the last annual meeting, the *Gazette* is informed that at a late meeting of the board of directors the question of a dividend was discussed and postponed until the then pending questions touching the purchase of the Indianapolis & St. Louis Railroad were settled, and the amount of disbursements required for that purpose ascertained. The I. & St. L. was subsequently bid in for $1,396,000, but the amount of *cash* required to be paid is not yet ascertained. The Court has yet to confirm the sale and decide how the money shall be disbursed. If it goes to the second-mortgage bondholders, the C. C. C. & I. will be greatly relieved, as that company owns about three-fourths of that issue. If, on the other hand, a portion goes to the payment of the floating debt, the C. C. C. & I. will be equally well provided for, as it holds a large portion of those claims. In either case, or both, the amount to be paid for the property will be very materially reduced from the amount the road was sold for."

Cleveland & Marietta.—Arrangements have been made by which this company will use the track of the Cleveland & Pittsburgh's Tuscarawas branch from Canal Dover, O., to Zoar, eight miles. At Zoar connection is made with the Wheeling & Lake Erie road, and in a short time through trains will be run by this route between Marietta and Toledo.

Danville, Olney & Ohio River.—This road is completed to Olney, Ill., the crossing of the Ohio & Mississippi road, and the line was formally opened to that point on Aug. 23. Olney is nine miles southward from the late terminus at West Liberty, and 110 miles from Danville. This road is now 82 miles long, from Olney to Sidell's Grove, its trains using the Chicago & Eastern Illinois track from Sidell's Grove to Danville, 28 miles.

Denver, Longmont & Northwestern.—Other suits have been brought against this company, and Denver dispatches report that its employés have not been paid for some time.

Des Moines, Osceola & Southern.—Track on this road is now laid to Des Moines, Ia., 41 miles northward from the starting-point at Osceola. Regular trains were to be put on this week.

East Line & Red River.—This road was practically consolidated with the Missouri, Kansas & Texas some time ago, although the organization of the company is nominally maintained. Recently the Attorney General of Texas began a suit against the East Line & Red River Company for forfeiture of charter for non-compliance with the law, which requires that all railroads operated within the state shall have a general office in the state, and officers thereof shall reside therein. A reply has been made that the Secretary and a number of directors of the company are residents of the state, and that a general office is maintained there. To this the Attorney General answers that affidavit will be made by responsible citizens that the railroad company in question has been consolidated with the Missouri, Kansas & Texas road, in violation of the state constitution; that all the records and officials have been removed from the state, except depot agents; that the alleged Secretary is a sham; that the directors are mere appointees of Mr. Gould, and business is done through the St. Louis office, where the books of the company are kept. It is said that this suit is preliminary to others.

Ellendale & Wahpeton.—This company has been organized to build a railroad from Ellendale in Dickey County, Dak., eastward to Wahpeton on the St. Paul, Minneapolis & Manitoba road. It will be about 100 miles long.

Fulton County.—The extension of this road to Galesburg, Ill., was formally opened for traffic by an excursion on Aug. 22, and regular trains now run through from Havana to Galesburg, 55 miles.

Galveston, Harrisburg & San Antonio.—A branch is reported completed from Harwood, Tex., 67 miles east of San Antonio, southward 14 miles to Gonzales. Its construction was begun some time ago.

Georgia.—The Athens Branch is being extended from its old terminus at Athens, Ga., across the Oconee River into the central portion of the town, a distance of about a mile. New passenger and freight stations are to be built, and other improvements will be made on the branch.

Great American & European Short Line.—The old project of a railroad to the extreme eastern point of Nova Scotia, a ferry to Newfoundland and a railroad across that island to shorten the time between England and America, has recently been revived. A company with the somewhat formidable name given above has been organized, and has succeeded in getting a bonus of $50,000 from the town of Pictou, N. S., for a railroad from New Glasgow to Whitehaven.

Gulf, Colorado & Santa Fe.—Work is progressing well on the new branch from Leon, Tex., to Navasota, to connect with the Central & Montgomery road, lately bought by this company.

Surveys have been made for a branch from Alvin, Tex., to Houston. This branch will be 23 miles long, and will complete a second line from Galveston to Houston, 53 miles long.

Hot Springs & Mountain Valley.—This company has been organized to build a railroad from Hot Springs, Ark., to Mountain Valley, a distance af 12 miles.

Hudson Tunnel Railroad.—On Aug. 30 a small break occurred near the end of the tunnel on the New Jersey side of the Hudson River, letting out the compressed air and filling the tunnel with water. The workmen had plenty of time to escape, and it is thought that the damage done is not great.

Indianapolis & St. Louis.—The objections to the confirmation of the sale of this road have been withdrawn, and the court has made an order confirming the sale. It is probable that there will be still some litigation over the disposition of the proceeds of the sale, but that will not delay the organization of a new company by the purchasers.

Lake Erie & Western.—It is reported that this company is making arrangements to extend its road from Bloomington, Ill., to Peoria, 41 miles.

Lake Erie, Wooster & Muskingum Valley.—The contract for grading this road has been let to J.J. Maney, of Alliance, O. The road is to run from Wooster, O., north to Burbank on the New York, Pennsylvania & Ohio, and will be 15 miles long.

Leavenworth, Topeka & Southwestern.—It is announced that the owners of this road have sold their stock to the Atchison, Topeka & Santa Fe Company at a price not made public. The road was chiefly owned in Boston, and was intended to compete with the Atchison road for local business. It is now completed for about 30 miles from Leavenworth. The Atchison Company will extend it to a junction with its own line, and use it as a branch to Leavenworth.

Louisville, New Albany & Chicago.—It is said that this company intends to locate its principal shop at LaFayette, Ind., and that it is negotiating for the purchase of the buildings of the LaFayette Car Works.

Louisville & Nashville.—On the extension of the Knoxville Branch track is now laid to Robinson Creek, Ky., 10 miles southward from the late terminus at London and 164 miles from Louisville. The grading is nearly done to Williamsburgh, 20 miles further.

Marietta & Cincinnati.—As noted last week, the Court adjourned the hearing in the foreclosure suit, not being fully satisfied with the evidence presented that holders of the required amount of securities had signed the plan of reorganization. The Court finally made an order by which Selden S. Cook, of Chillicothe, O., is appointed Special Master Commissioner to proceed to the office of the Farmers' Loan & Trust Company, in New York, where he is to inquire, by personal examination, and by witnesses if necessary, how many bonds and how much stock has been transferred and delivered to the Reorganization committee. The Master is to further find whether the agreement to reorganize purports to be signed by the parties whose names are given in the list furnished the Court heretofore. The Master is ordered to begin his examination Sept. 26, and to report to the Court at the opening of the term, Oct. 16. The evidence that is to be taken by the Master is to settle a technical point. There is, in fact, no dispute as to the fact that a sufficient number of band and stockholders have signed the reorganization agreement. The mode of proving this adopted by the Reorganizing Committee was in accordance with the custom, and followed in reorganizing all companies of this class. The Court, however, thought that under a strict construction of the Ohio statute, the proof of signatures could not be made by the affidavit of the President of the Farmers' Loan & Trust Company, it being *ex parte* evidence. Had it not been for this technical ruling the decree for a sale and reorganization could not have been had at the special term.

The provisions of the decree of foreclosure and sale were discussed and partially settled, and the bill will be ready for action at the October term.

New Brunswick & Canada.—The transfer of this road to the New Brunswick Railway has been completed. The necessary papers have been signed, and the officers of the New Brunswick road were to take charge on Sept. 1.

New York, Chicago & St. Louis.—On Aug. 28 the track for this road was completed from Buffalo, N. Y., to the connection with the Illinois Central at Grand Crossing, Ill., 511.80 miles. Including the Central tracks used into Chicago, the whole distance from Buffalo to Chicago is 523.30 miles. The last track-laid was on the gaps from Derby, N. Y., to the New York, Lake Erie & Western junction at Buffalo, 15.60 miles; from the Cleveland & Pittsburgh crossing to the Lake Shore & Michigan Southern crossing at Cleveland, 7.24 miles, and near Grand Crossing, 1 mile. Trains crossed the great viaduct at Cleveland on Aug. 28, and on the following day a train ran through over the whole road with officers of the company. About 500 miles are thoroughly ballasted. Work on all depots is well advanced, and many are complete. The round-house and shops at Bellevue are finished, and work on the shops at Conneaut is well under way.

It is stated that the telegraph line over the road will be entirely independent of all other lines. The company has organized a new fast freight line—the Trader's Dispatch—which will run over this road, the Lake Erie & Western, the Cincinnati, Hamilton & Dayton, the Erie, and the Lehigh Valley. The Western Express Company has also been organized at Chicago to do the express business over the new road and its connections.

New York, Lackawanna & Western.—The Buffalo *Express*, of Aug. 28, says: "There remains but about half a mile of track to lay between the Lackawanna's connection with the Grand Trunk tracks at International Bridge, Black Rock, and Binghamton. That half mile is on the Black Rock branch east of the Central over-head crossing. To-day it is expected this strip will be laid, and the Lackawanna will then have a single track railroad complete to Niagara River. There is a double track between Binghamton and the Black Rock terminus, with the exception of about eight miles within the city limits from North Buffalo to Ogden street. This second track will be finished next week. Out on the line all the bridges are in place except the one to cross the Genesee River, and a few days will see that finished. At East Buffalo, at the junction of the two city branches, the Lackawanna is making a large yard. Ground is cleared for 14 long sidings, which are being rapidly laid. A round-house with 21 stalls is building, and a turn-table was put in place yesterday. At Black Rock the site is leveled for a depot between Parish and Thompson streets, 20 by 100 ft. A fortnight more will see this building ready for use. A large force of men is now at work on the eight-track yard to be built mostly on the river side of the two main tracks. As stated yesterday, coal pockets will probably be built at the trestle just beyond the Central crossing. The size of this work is not definitely settled. We are assured that coal trains will be running over the Lackawanna between Binghamton and Black Rock in about a fortnight's time.

"On the south branch work is progressing equally fast. The masonry at the Erie crossing is yet to finish. The Dingens street piers and the piers for the two bridges over Buffalo River and at the Lake Shore crossing are ready for the bridges. The piers at the Erie crossing will be ready Sept. 10. * * * Track-laying on this line goes forward rapidly at several points. Yesterday the iron was laid on Prime street for some distance. The matter of a depot site in this part of the city is still unsettled, and it is quite likely that the company will use the old Ætna Block, which now contains its offices, as a passenger station for some time after the line is opened for passenger traffic. This date is set for Nov. 30."

The length of the new road from Binghamton to Buffalo is 204 miles, making the distance from New York to Buffalo 414 miles, against 423 by the Erie and 440 by the New York Central.

New York, Lake Erie & Western.—The Erie Elevator in Buffalo caught fire on the morning of Aug. 25, and was entirely destroyed. The fire spread so quickly that five of the men employed were unable to escape and were killed. The elevator had a capacity of 600,000 bushels of grain, and was one of the largest in the city. The loss is estimated at $500,000, partly covered by insurance. The cause of the fire is unknown.

The big bridge across the Kinzua chasm on the Erie extension, 15 miles south of Bradford, Pa., was completed Aug. 29. It is expected that trains will be running over it within 10 days. The engineers and employés had a jollification over the event in the afternoon. The bridge is a symmetrical iron structure and is the highest in the world, the centre spans being 301 ft. in height and the length of the structure 2,060 ft. The completion of this bridge gives the New York, Lake Erie & Western Railroad direct communication with the coal fields of Western Pennsylvania, and the branch may eventually be utilized as the shortest and most economical route to the Great West. The Rochester & Pittsburgh Railroad also has a traffic arrangement with the Erie for the use of this bridge.

New York & New England.—The Boston *Advertiser* of Aug. 30 says:

"The recent heavy increase of freight traffic on the New York & New England road is testing its capacity to the utmost. Saturday night there were nearly 1,000 cars at Hartford waiting to be forwarded to Boston. Sunday a grand effort was made to relieve the blockade, which was the accumulation of a week or more. After the last passenger train was out of the way Saturday night, every available engine at Boston, Providence and way points was rushed through to Hartford. Passenger and freight engines alike were called into service, and a big day's work was done. Fully 200 cars were taken out of the New Haven road yard and started eastward. Eighteen trains were started out before 9 a. m., and others at frequent intervals all through the day and night."

New York, Ontario & Western.—Surveys are to be made for an extension of the New Berlin Branch from New Berlin, N. Y., north to Bridgewater, about 20 miles, through the Unadilla Valley.

New York, West Shore & Buffalo.—There are now employed on this road and the New York, Ontario & Western from Weehawken to Middletown and from Cornwall to Syracuse 18,294 men; 116 steam and compressed air drills, equal to 1,392 men; 14 steam excavators, equal to 1,400 men; 4 dredging machines, equal to 1,600 men, making a total force equivalent to 22,686 men. There are also employed in construction 3,131 horses and carts, 27 locomotives, 1,080 cars; 14 pile drivers, 76 steam derricks, 10 steam pumps and 23 tugs, barges and canal boats.

North Carolina Midland.—The stockholders of this company met in Winston, N. C., Aug. 24, and voted to authorize the board of directors to issue bonds to provide for the construction of the entire road, and to execute a mortgage to guarantee the said bonds; also to lease the line, when completed, to the Virginia Midland Railroad Company.

Steps will be taken at once to carry out the above resolutions, and it is thought the construction of the road will be commenced at an early day. The North Carolina Midland road will extend from Danville, Va., through Rockingham, Stokes, Forsythe, Davidson, Davy and Rowan counties, in North Carolina, to Mooresville, Iredell County, on a line generally parallel to but some distance west of the Richmond & Danville's line.

Paducah & Chicago.—This company has been organized to build a railroad from the Ohio River at Brooklyn, Massac County, Ill., by way of Big Bay, Golconda and Rock Quarry, on the Ohio River, in Pope County, and in Hardin County, through the valley of Hog Thief Creek and the Saline mines, to Shawneetown, and thence to a point on the Wabash River in Gallatin County.

Pennsylvania.—Surveys and locations have been adopted for three branches of the Southwest Pennsylvania line, which are to reach new points in the Connellsville coke region. These locations are as follows:

From a point on the Youngwood Branch, by Boyer's Run, to Mount Pleasant, east side, or Texas.

From the north end of the June Bug Branch (where the extension of same which is known as the Morewood Branch begins), via Fox's Summit to a point on the main line, about a mile south of Tarr's station.

From Uniontown, near Beeson's Mill, up Beeson's or Coal Lick Run, through the west side of the town, and thence on to the main line, by Brown's Summit.

Philadelphia & Reading.—Copies of a circular have been received in Philadelphia, purporting to be issued in London, and asking for subscriptions to the deferred income bonds which were not taken when the first subscription to those securities was made. This circular—if it is genuine, of which there are some doubts—is taken as indicating that the subscription to the new general mortgage bonds has been a failure. It is not thought probable, from other indications, that any large amount of the new bonds has been taken. The company has made no statement, and there is no official information on this point.

Pittsburgh & Western.—This road is now completed and opened for business to Chewton, Pa., six miles beyond the late terminus at Wartemburg, and 51 miles from Pittsburg. This extension of six miles runs along the Conoquenessing Creek, and required a great deal of rock cutting. Work is being pushed on the extension from Chewton to New Castle Junction.

The third or standard-guage rail is to be laid over the whole line in September. It is expected that the standard-guage engines and cars will be delivered during the month.

Rochester & Pittsburgh.—At a special meeting in New York, Aug. 28, the stockholders voted to authorize the issue of $5,000,000 additional stock, making the whole amount $15,000,000. The new stock is to be used to purchase the stock of the extensions of the road in Pennsylvania, and to retire the income bonds issued on the Buffalo Division.

St. Louis & San Francisco.—St. Louis papers report that this company has just closed a sale of 165,000 acres of land in Jasper, Newton, and McDonald counties, which are located in the southwestern part of the state, to the Missouri Land & Live Stock Company, of Edinburgh, Scotland. The sale was for all cash, on private terms as to price, and the land adjoins the 140,000 acres sold to another Scotch company, and is all grain or choice grazing lands. The lands are to be used chiefly for stock farms.

San Luis Obispo & Santa Maria Valley.—This road was built some years ago from San Luis Obispo, Cal., to Port Harford, the steamer landing on the coast, 11 miles. Recently an extension has been completed from San Luis Obispo, by the Arroyo Grande, to Santa Maria, 31½ miles.

The business of the section between San Luis Obispo and Port Harford depends altogether on the steamships, and trains over this part of the line are run entirely by telephone—probably the only road in the country where they are so run.

Seaboard & Raleigh.—The track on this road is now laid to Robersonville, N. C., 11 miles west of Williamston on the Roanoke, the starting point. From Tarboro east the grading is done to Bethel, 10 miles, and tracklaying has been begun.

Shenandoah Valley.—People on the line are trying to induce this company to build a branch from Boonesboro, Md., to Frederick, 24 miles. Committees have been appointed to secure subscriptions and right of way along the line.

Sinaloa & Durango.—The track of this road is now laid from the port of Altata, Mexico, on the Gulf of California, to within four miles of the city of Culiacan.

The following extracts, translated from *El Continental* published at Culiacan, are of interest; they show that in some matters Mexican customs do not differ greatly from those of the United States, where a railroad is concerned:

"The Superintendent of the Sinaloa & Durango Railroad Company, Limited, has already received orders from the Board of Directors of that company to push on the building of the road from this city (Culiacan) to Durango.

"The people who felt so sure that the railway from Altata would never be extended beyond Culiacan may now set themselves down as flats. * * *

"The members of the state government gave a reception on the 10th inst. to General Marcos Gorrillo, in the form of a banquet at the the Railway Hotel, at which the most notable people in town were present.

"*Twenty thousand dollars*—this is the sum which Don Pomposa Verduga asks for his garden which the railway company claims for their station. Some will set this down as a canard; but we can vouch for its being the pure truth. We, too, would like to get $50 apiece for out weekly; the trouble would be, however, to find purchasers.

"We have been examining the great bridge which the Sinaloa & Durango Railway Company have constructed over the river Humaya, opposite to the town of Limocito. It is an admirable piece of work, and we think that it will answer all the purposes of its construction."

Tehuantepec.—President Learned has issued a circular relative to the action of the Mexican government, in which he says:

"This forfeiture has been declared, regardless of the fact that an expenditure of about $50,000 only is required to complete the unfinished section. That at the time of forfeiture there was due from the government the sum of $75,000 for subsidy earned on an accepted section. That $100,000 of the guarantee deposit was held by the government depository in Mexico. The expenditure for rails, ties, and materials delivered, and for work done on other sections of the road, had been vastly in excess of the above estimated $50,000. That the outfit, supplies, material and work furnished by the company represented expenditures and liabilities of nearly $3,000,000. That the work, etc., is estimated to be equal to nearly one third of the cost of the entire road. That the several extensions of time which have been granted by the government were results of uncontrollable causes (*fuerza mayor*) provided for in the grant—hence not acts of favor but of right. The government having suffered no damage, the company claims that a forfeiture which imperils millions of foreign capital from a merely technical cause is unjust, illegal, and without precedent or parallel where commercial treaties are recognized. That the default now alleged is largely attributable to adverse legislation—in violation of our concession, and injurious to our financial negotiations. In case negotiations now pending for an amicable arrangement shall fail, the company is entitled to appeal to the tribunals of Mexico. The bondholders, whose rights are secured by a mortgage which covers all the property of the company—including the location of route—and which has been formally authorized, approved and registered by the government, may invoke similar or other proper authorities to sustain their rights. If the forfeiture is insisted on and sustained by tribunals, the grant provides that the government or new grantee shall be obliged to take the whole property, making such payment therefor as shall for that purpose be approved by experts appointed by both parties, and in case of disagreement, by a third expert selected by the other two. From the valuation placed upon the road shall be deducted the amount which may have been received by the company as subsidy, and the balance shall be paid in cash, or at a term of 25 years, with interest at 10 per cent per annum.

Texas & St. Louis.—Work on the extension of this road westward has been temporarily stopped on account of the refusal of the town of Gatesville to fulfill its agreement to furnish right of way and station ground. The work will not be resumed until it is decided whether the road is to go through Gatesville, or to pass by on one side of the town.

Toledo, Cincinnati & St. Louis.—This road has been opened for traffic to Charleston, Ill., 80 miles southwest of the late terminus at Veedersburg, Ind., and 330 miles from Toledo. The work is being pushed as fast as possible between Charleston and East. St Louis.

Tonawanda Valley & Cuba.—Track is now all laid on the extension of this road from Arcade, N. Y., southward to Cuba, 24 miles. The road will soon have trains running from Attica, N. Y., to Cuba, 50 miles.

Union Pacific.—On the Denver & South Park Division, the Gunnison Branch is now completed to Gunnison, Col., 207 miles from Denver, 72 miles from the main line at Buena Vista, and 30 miles beyond the last point noted.

The Breckenridge Branch of the same division is now completed to Breckenridge, 18 miles northwest of the late terminus at Boreas, 28 miles from the main line at Como, and 116 miles from Denver.

The Cheyenne *Leader* says: "The Oregon Short Line is being pushed with remarkable energy at this time. Starting from the Union Pacific at Granger, 155 miles east of Ogden, it has already reached a western extension beyond Montpelier, to which trains are now regularly running. It is 114 miles from Granger to Montpelier, and over this a mixed train passes each day. From Montpelier to the crossing of the Utah & Northern it is 100 miles, making the road from Granger to Pocatello 214 miles. Soda Springs will be reached in about ten days by the track-layers, which place is about 45 miles west of Granger. The track is being built eastward from Pocatello, and the gap will be closed so as to give all rail from Granger to Pocatello by Oct. 1. The stations on the road now operated west of Granger are Twin Creek Mines, Fossil, Cokeville and Montpelier, each of which has an agent. There are also a number of other stations, but as yet of no importance. The Bear Lake country is now tributary to Montpelier. The Pacific Express has established offices at the places named, and is ready for business. West of Pocatello the road is far out beyond American Falls, and they are pushing the track as fast as men can do it. In tracklaying machinery is used to send the material forward, where it is taken by men and put in place, spiked down, a pair of rails at a time, and then the train which supplies the ties and iron is backed up over these rails and another pair are put in place. This enables each gang of men to lay about one mile of track per day, and, as this track-laying is going on at three points, the road is growing at the rate of nearly three miles per day. It will not be long until Wood River is reached, which is 30 miles west of American Falls, or 103 miles west of the Utah & Northern. The branch road up Wood River to Bellevue and Hailey has such a large force of men employed on it that the grade will soon be ready for the track, and this will most likely be laid before work for the winter is stopped. The energy shown in the construction of this insures its early completion through to Oregon. It is thought that men will be able to work on the grade through Idaho much of the winter.

Union Railway, Transfer & Stockyards Co.—The lease of this company's road—better known as the Indianapolis Belt road—to the Indianapolis Union Company has been completed. As soon as possible arrangements will be made to do all the work of freight transfer by the Belt tracks, reserving the Union tracks for passenger and local freight trains.

Wabash, St. Louis & Pacific.—This company's Des Moines Division is now completed to Eads, Ia., 21 miles northwest of the late terminus at Jefferson, and 87 miles from Des Moines.

On this company's leased Des Moines & St. Louis line track is now laid to Des Moines, 69 miles northwest of the starting-point at Albia. The track is very nearly all finished up, and regular trains will probably run to Des Moines in a week or ten days.

Warren & Farnsworth Valley.—This road is now completed and in operation from Clarendon, Pa., on the Philadelphia & Erie road, to Tionesta, in Forest County, about 12 miles. It reaches the new Garfield oil district.

Western & Atlantic.—Some months ago the Attorney General of Georgia, in response to a resolution of the Legislature, filed an opinion that the bond given by this company to the state of Georgia to secure the faithful performance of the conditions of the lease was insufficient for various technical reasons. Soon after the Attorney General began proceedings to test the case by filing an information in the nature of a *quo warranto*, r inquiring as to the right of the lessees to exist as a corporation. Last week the case came up in the Chattahoochie Circuit Court at Atlanta on a demurrer filed by the company, taking exceptions to the jurisdiction of the Court, and making various other technical objections, and also on a motion to dismiss the case.

After hearing arguments, the Court set aside both the motion and the demurrer, and ordered the case to proceed. A bill of exceptions was thereupon filed and an appeal from the decision taken to the Supreme Court. Meantime, the case will proceed in the Circuit Court, and it has been set for trial on Sept. 14. The suit will involve the whole question of the lease, and also of the standing of the original lessees who have transferred their shares.

West Pennsylvania & Shenango Connecting.—The contract for grading this road from Coalville, Pa., on the Shenango & Allegheny road, to Butler, 24 miles, has been let to W. W. Reed, of Erie, Pa., who has already begun work. The road is owned jointly by the Shenango & Allegheny and the Pennsylvania Railroad companies.

West Virginia Central & Pittsburgh.—There are now nearly 30 miles graded on the extension of this road to the Fairfax Stone.

The total net receipts of the company from transportation and coal sales for the seven months ending July 31 were $57,699. The total production of coal was 121,316 tons. The receipts for the first quarter were small, owing to the unfinished state of the road.

West Virginia Coal Railroads.—Four short branches of the Chesapeake and Ohio road have been lately completed or are in progress in West Virginia. They are all built to reach coal or iron deposits, and are as follows:

The *Cabin Creek* road leaves the Chesapeake and Ohio 17 miles above Charleston, and is nearly all graded to the coal mines, 10 miles up the creek. This road is owned by some Baltimore people.

The *Davis Creek* road starts four miles west of Charleston and is nearly finished for 12 miles, to a point where there is a large deposit of black band iron ore. It also passes a coal mine. It is owned by the Davis Creek Iron Company, of Boston.

The *Field Creek* road begins at a point 13 miles east of Charleston, and is finished to the coal mines, six miles up the creek. It is owned by the Winifrede Coal Company, a Philadelphia concern.

The *Paint Creek* road is completed from a point 21 miles east of Charleston, up Paint Creek five miles to the cannel coal deposits. These deposits are now being worked. This branch is of 3 ft. guage; the others are all standard guage.

Willard Asylum.—The Elmira (N. Y.) *Advertiser* says: "A large force of the better class of inmates at Willard Insane Asylum are at work on a narrow-guage railroad that is now being built from Hayt's Corners, on the Geneva, Ithaca & Sayre Railroad, to Willard Asylum. The state, through the management of the asylum, will furnish the right of way and grade the road, for the privileges it will afford, and the Lehigh Valley will complete, equip and operate it for its own benefit."

It is also said that the branch will be extended to Elmira.

ANNUAL REPORTS.

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Louisville & Nashville	450		

St. Louis, Alton & Terre Haute.

This company owns a line from Terre Haute, Ind., to East St. Louis, Ill., 189 miles, with a branch to Alton, 4.2 miles. It also owns the Belleville Branch, East St. Louis to Belleville, 14.4 miles, and leases the Belleville & Southern Illinois, Belleville to Duquoin, 56.4 miles, and the Belleville & Eldorado, Duquoin to Eldorado, 50.2 miles. The Main Line and Alton Branch are leased to the Indianapolis & St. Louis Company. The line worked by this company is the road from East St. Louis by Belleville and Duquoin to Eldorado, 121 miles.

The equipment of this line worked consists of 16 locomotives; 12 passenger and 3 baggage, mail and express cars: 196 box, 25 stock, 40 flat, 490 coal and 4 caboose cars.

The general account is as follows, somewhat condensed:

Common stock		$2,300,000.00
Preferred stock		2,488,400.00
Funded debt		8,357 000.00
Sinking fund		655,000.00
Accrued interest		134,750.00
Unpaid coupons		86,016.02
Balance of income		782,569.69
Total		$14,783,735.71
Stock account	$13,125,400.00	
Special bond investment	303,530.55	
Trustees of sinking fund	655,000.00	
Due from lessee	458,450.13	
Cash and accounts	241,355.03	
		—$14,783,735.71

The funded debt consists of $300,000 equipment bonds; $2,200,000 first-mortgage bonds; $2,800,000 second-mortgage preferred bonds; $1,700,000 second-mortgage income bonds; $1,357,000 dividend bonds. These dividend bond were issued for arrears of dividends on preferred stock. The company holds $246,000 of the equipment bonds. The yearly interest charge (not including the dividend bonds, on which interest is payable only when earned) is $469,000.

THE MAIN LINE.

The earnings of the main line as reported by the lessee were as follows:

	1881.	1880.	Inc. or Dec.		P. c.
Freight	$936,740	$945,240	D.	$8,500	0.9
Passengers	333,485	312,905	I.	20,580	6.6
Mail, etc	90,794	159,518	D.	68,724	43.0
Total	$1,361,019	$1,417,663	D.	$56,644	4.0
Expenses	1,305,508	980,724	I.	324,784	33.1
Net earnings	$55,511	$436,939	D.	$381,428	87.3
Gross earn. per mile	7,045	7,338	D.	295	4.0
Net " "	287	2,262	D.	1,975	87.3
Per cent. of exps	95.9	69.2	I.	26.7	....

Under the order of the Court the lessee paid over 30 per cent. of the gross earnings, being $408,305.72, or $41,694.28 less than $450,000, the minimum rental fixed by the lease. The total claim for shortage on the rental at the close of the year amounted to $534,368.84.

The litigation over the lease still continues A decision has recently been rendered establishing the liability of the lessee and of the guarantor companies. This decision holds two of the guarantors, each for one-third of the liability, but not for the share of the third guarantor, which has become insolvent. It is probable that the case will be appealed to the Supreme Court. Meantime the lessee company has become insolvent and its road has been sold under foreclosure, subject, however, to the liabilities imposed by the lease.

THE BELLEVILLE LINE.

The traffic of the line worked, 121 miles, for the year was as follows:

	1881.	1880.	Inc. or Dec.		P. c.
Passengers carried	199,389	169,634	I.	29,755	17.5
Passenger-miles	5,268,959	4,744,907	I.	524,052	11.0
Tons freight carried	287,226	262,511	I.	24,715	9.4
Ton-miles	16,790,357	14,558,004	I.	2,232,353	15.3
Tons coal carried	391,689	378,202	I.	13,487	3.6
Coal ton-miles	10,649,473	11,307,352	D.	657,879	5.8
Av. rate:					
Per passenger-mile	3.00 cts.	3.17 cts.	D.	0.17 ct.	5.4
Per ton-mile, freight	1.75 "	2.06 "	D.	0.31 "	15.0
Per ton-mile, coal	2.50 "	2.20 "	I.	0.30 "	13.6

The average cost per passenger mile was 2.31 cents; per ton mile, freight and coal, 1.14 cents.

The total freight exchanged with the Illinois Central at Duquoin was 246,470 tons. Of this 160,254 tons were through freight between St. Louis and Cairo. On this through freight the average rate was 1.07 cents per ton mile south-bound, and 0.83 cents north-bound; an average of 0.94 cent per ton-mile.

A contract has been made with the St. Louis Central Company for carrying its coal from Pinckneyville and East St. Louis, which will bring a considerable traffic to the road. In order to secure additional coal traffic, arrangements have been made for a branch to East Carondelet, to be under the control and management of this company.

The earnings of the line operated were as follows:

	1881.	1880.	Inc. or Dec.		P. c.
Freight	$234,118	$299,999	D.	$5,881	1.9
Coal	266,537	248,234	I.	18,303	7.4
Passengers	158,279	150,313	I.	7,957	5.3
Mail, etc	37,100	30,532	I.	6,568	21.5
Total	$756,025	$729,078	I.	$26,947	3.7
Expenses	434,815	352,230	I.	82,585	23.5
Net earnings	$321,210	$376,848	D.	$55,638	14.8
Gross earn per mile	6,248	7,602	D.	1,354	17.8
Net earn. per mile	2,655	3,930	D.	1,275	32.4
Per cent. of expenses	57.5	48.3	I.	9.2	....

The Belleville & Eldorado line was worked only six months in 1880, making the average mileage for that year 95.9 miles, against 121 miles last year.

The increase in expenses was chiefly due to the laying of steel rails and new ties, and to increased labor on the roadbed. There were 1,879 tons of steel rails and 46,947 new ties laid. A new car shop was built at East St. Louis to replace the one burned there last year.

The net earnings of the line operated, as above, were $321,209.41. The rental of the Belleville & Southern Illinois road was $146,662.92; of the Belleville & Eldorado, $14,640.63; total rentals, $161,303.55, leaving a net balance of $159,905.86 from the operations of this line.

The income account is as follows:

Balance from 1880		$735,286.99
Minimum rental of Main Line		450,000.00
Earnings of line operated		756,024.72
Interest, etc		3,043.87
Total		$1,944,355.58
Expenses of line operated	$434,815.31	
Main Line and legal expenses	22,615.63	
Rentals	161,303.55	
Interest on funded debt	469,000.00	
Preferred stock dividends	74,052.00	
		1,161,785.89
Balance		$782,569.69

This balance is not an actual cash balance, but is composed principally of claims for rent against the lessees, which are now in litigation, and of the nominal par of equipment mortgage bonds, received in part settlement of the suit against the Purchasing Committee.

The trustees of the sinking fund report $636,000 bonds on hand and $152,562.50 on deposit. No bonds were bought during the year, none having been offered within the limits prescribed by the trust.

In accordance with the action taken by the stockholders in 1880, a settlement was made with the preferred stockholders for arrears of dividends by the payment of 3 per cent. on their stock in cash, and 55 per cent. in dividend bonds, the issue of which was duly authorized for that purpose by vote of the stockholders.